From Chalkboard to Smart board: Digital Revolution in NEP 2020

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Abstract— **Present era is a digital technology (AI) era. Education, business, health, entertainment, lifestyles etc. every field of human life highly effected by digital technology. For the excessive use, digital technology has led to the digital revolution. NEP 2020 positions digital education as a cornerstone for transforming higher secondary education, emphasizing equity, quality and access. The National Education Policy (NEP) 2020 has introduced a significant transformation in the Indian education system by emphasizing digital learning and technological integration. The transition from traditional chalkboard teaching to smart board–based learning represents the digital revolution in education. Through digital technology, teaching and learning have become easier, more attractive and more effective. In the digital revolution, a teacher becomes a guide on the side rather than a sage on the stage. Digitalization presents challenges regarding the fostering of various beneficial emotions and the socialization of moral values. Therefore, to keep pace with contemporary civilization and scientific- technological advancements. The present paper attempts to address the characteristics and significance of digital revolution. It also discusses the importance of online learning platforms, smart classrooms, e-learning resources, It also tries to focus on merits, demerits, and role of teacher in digital revolution in the field of education. The study concludes that effective implementation of digital education under NEP 2020 can create an inclusive, innovative, and future-ready education system in India.**

Index Terms— **Digital education, Digital Revolution, Digital Technology, NEP 2020**

I. INTRODUCTION

The NPE 2020 marks a new era in the Indian education system by promoting the integration of technology into teaching and learning. The shift from traditional chalkboards to modern smart boards represents not just a change in tools, but a transformation in the way education is delivered.

School and higher education institutions rapidly adopted online platform during COVID19. High mobile phone penetration enabled students to access educational content through smartphone, especially via government platforms like DIKSHA and SWAYAM. With the rise of digital platforms like DIKSHA classrooms are becoming more interactive, engaging and accessible. This digital revolution aims to enhance learning presence, develop critical thinking skills and prepare students for a technology- driven world. In NPE 2020 digital education transforming education, emphasizing three main things-equality, quality and access.

II.OBJECTIVES

1. To find out characteristics of digital revolution in education.
2. To identify the various aspects of digital revolution in education.
3. To list out the merits and demerits of digitalization in education.
4. To identify the role of teachers in digital revolution.
5. To find out the impacts of digital revolution on education.

Digital Technology: Digital technology refers to electronic tools, systems, and devices that generate, process, or store data using binary code.

It includes devices like computers, smartphones, the internet, and software applications that help us communicate, learn, and work more efficiently. Examples of digital technology are computers, mobile phones, online learning platforms, digital cameras, etc.

Digital Revolution:

The Digital Revolution refers to the rapid shift from analog and mechanical systems to digital technology. It has emerged across various sectors driven by the application of digital technology. This digital technology era began in the 1980s.During 1980's and 1990's first phase of digital revolution started. In this time main focus on the digitalization of products. The decade of the2000's witnessed the widespread penetration of broadband technology. This current period is also referred to as 'Age of the Digital Revolution'.

This revolution has transformed almost every field, including education, healthcare, business, and communication. It has made information easily accessible, improved efficiency, and connected people globally.

In education, digital tools like online classes, e-books, and smart classrooms have made learning more interactive and flexible. The Digital Revolution is a major technological change that has made life faster, easier, and more connected. Through the digital revolution, teaching process moved from chalk and talk methods to multimedia-based learning using videos, simulations, quizzes and interactive digital tools.

However, it also brings challenges such as over dependence on technology, data privacy issues, and reduced face-to-face interaction.

NPE 2020: The National Education Policy 2020 (NEP 2020) is a major reform introduced by the Government of India to transform the education system. It replaced the 1986 education policy and aims to make education more holistic, flexible, and skill-based.

NEP 2020 introduces a new 5+3+3+4 structure covering ages 3–18, focusing on early childhood care and education. It promotes multilingual learning, especially teaching in the mother tongue at the primary level.

The policy emphasizes critical thinking, creativity, and experiential learning instead of rote memorization. It also encourages the use of digital technology and online learning platforms.

In higher education, NEP 2020 supports multidisciplinary studies, flexible course choices, and multiple entry and exit options. It also aims to increase the Gross Enrolment Ratio (GER) and improve the overall quality of education.

It focuses on integrating technology, such as AI, VR (Virtual Reality) and digital platforms like DIKSHA, to foster critical thinking, enhance personalized learning, bridge the digital divide and equip students with future ready skills. NEP 2020 aims to create an inclusive, modern, and skill-oriented education system in India.

Digital Education: Digital education is the innovative use of technology –such as e-learning platforms virtual reality and AI –driven tools-to enhance teaching and learning, making it more interactive, personalized and accessible beyond traditional classrooms. Its importance lies in fostering inclusive access to education, enabling flexible self-paced learning, reducing costs, and equipping students with essential digital literacy for the modern workforce. Online degree programs, various educational apps (Duo lingo, Khan Academy), Virtual Reality (VR) Labs, digital classes are the practical fields of digital education.

III.CHARACTERISTICS OF THE DIGITAL REVOLUTION

The key characteristics of the digital revolution include:

i) Digital Educational Resources:

Digital tools utilized in education comprise e-books, videos, software, smart classrooms, and similar resources.

ii) Online Learning Platforms:

A defining feature of the digital revolution in education is the emergence of online learning platforms—such as Learning Management Systems (LMS)—through which instruction is delivered.

iii) Personalized Learning:

By leveraging digital technology, education can be tailored to meet the individual needs and capabilities of each student.

iv) Opportunities for Self-Learning:

Because of the digital revolution, students are empowered to learn at their own pace and on their own schedule.

v) Remote Education:

The digital revolution ensures that students residing in remote locations can also easily access educational opportunities.

vi) Digital Devices and Software:

The digital revolution places a strong emphasis on learning facilitated with digital devices and software within the educational process.

vii) Enhancement of Digital Skills:

Through the digital revolution, students gain the ability to utilize new technologies, thereby helping to enhance their digital proficiency.

viii) Democratic Access:

The Digital Revolution has democratized access to education. In other words, students can access educational opportunities in accordance with their individual capabilities and aptitudes.

ix) Communication and Collaboration:

The digital revolution in education has created opportunities for collaboration and communication among students through the use of online platforms and digital tools.

x) Creativity and Innovation:

A defining characteristic of the digital revolution is the fostering of student creativity and innovation; specifically, students can utilize technology to easily express their creative skills, thereby enhancing their problem-solving abilities.

xi) Global Connectivity:

The digital revolution in education provides students with opportunities to connect globally, which aids in expanding their knowledge and experiences.

xii) Modernization of Education:

It has modernized educational practices by introducing innovations and methodologies into the education system.

Through the digital revolution in education, the learning environment, teaching-learning systems, educational administration, and assessment processes have all been enhanced, making education more.

IV.DIGITAL REVOLUTION IN THE FIELD OF EDUCATION

The various aspects of the digital revolution in education are discussed below:

- E-Learning: An modern educational system reliant on electronic technology is termed Electronic Learning, or E-Learning. Everything—ranging from radio broadcasts to mobile applications—falls under the scope of E-Learning. Through E-Learning, students gain the opportunity to access and utilize digital content repeatedly, as per their specific needs. Consequently, E-Learning has become immensely popular worldwide in recent times.

Examples of E-Learning in India:

(i) NPTEL: NPTEL is a national program that offers online courses across the disciplines of Engineering, Science, and the Humanities.

(ii) SWAYAM: SWAYAM is an online educational platform that provides free courses in higher education and various other subjects.

(iii) BYJU'S: BYJU'S is an online tutoring platform that offers preparatory courses for various competitive examinations.

(iv)Virtual Classrooms: Many educational institutions establish virtual classrooms using platforms such as Zoom, Google Meet, and Microsoft Teams, enabling teachers and students to participate in online classes with ease.

- E-Content- It refers to any information, images, audio, or other materials published in a digital medium that can be delivered to students via the Internet or a computer network. Examples of e-content include interactive games, quizzes, simulations, e-books, slide presentations, e-learning games, infographics, etc.
- Mobile Learning: It involves the use of personal electronic devices through which students master subject matter. Devices such as notebooks, tablets, mobile phones, MP3 players, handheld computers, etc., fall under the scope of M-learning.
- E-Book: An electronic book (E-Book) is a digital version of a book that can typically be read on devices such as computers, laptops, or tablets. In other words, an e-book is a digital publication that utilizes electronic files instead of paper. Examples

include Amazon Kindle, Apple i Books, Google Play Books, Kobol, etc.

- E-Library: An e-library, or digital library, is a library where books, journals, articles, videos, and other information are stored in a digital format. An e-library functions much like a traditional library; however, the books here exist in a digital format rather than on paper, and they can be accessed using a computer or other devices. Information within an e-library can be searched for with ease. Examples of E-libraries: (i) Digital Public Library, (ii) Open Library, (iii) Internet Archive, (iv) CAD Library, (v) various online journals and databases, etc.
- E-Classroom: An E-classroom is an online or virtual classroom where students can receive instruction via the Internet or other digital platforms.
- Digital Tools: Digital tools are programs, software, or web resources that simplify, enhance, and streamline digital processes and overall digitization efforts. Digital tools serve to improve the teaching and learning process; consequently, the education system becomes more diverse and engaging. Examples of digital tools include Quizizz, Kahoot!, edX, Udemy, Google Docs, etc.

V.MERITS OF DIGITALIZATION IN EDUCATION

The merits of digitalization in education include:

1. Expanded Scope of Knowledge:

Students can acquire knowledge on a vast array of subjects with much greater ease. Just as we are able to access diverse educational information from around the globe, it has also become possible to share information regarding our own country with others.

2. Increased Interest:

Consequently, digitalization fosters a heightened sense of interest among students in exploring and learning new subjects.

3. Intellectual Development:

Given the opportunity to access educational resources and information from across the world, students are experiencing rapid intellectual growth.

4. Social Development:

Through digitalization, individuals are gaining insights into the societies and cultures of other nations, alongside a deeper understanding of our own country's social and cultural fabric.

5. Enhanced Connectivity:

As a result of digitalization, communication has improved significantly—not only among people residing in different parts of our own country but also in terms of connecting with and learning about people from other nations.

6. Diverse Educational Resources:

Various educational tools and systems—such as EDUSAT, e-GyanKosh, e-books, e-journals, and various forms of haptic technology—are being effectively utilized to disseminate education to the general public.

7. Reduction in Cost and Time:

The implementation of digitalization in the education sector has led to a reduction in operational costs, making it possible to impart education to a much larger number of students in significantly less time.

VI.DEMERITS OF DIGITALIZATION IN EDUCATION

While the complete digitalization of the education system offers numerous merits, it also presents certain demerits. These include:

1. Teacher-Student Relationship:

Under a digitized system, the lack of opportunities for direct, face-to-face interaction between teachers and students hinders the proper development of a meaningful teacher-student relationship.

2. Failure to Foster Sentiment:

Through this system, students often fail to develop a strong sense of attachment or sentiment toward their educational institutions, teachers, and fellow students.

3. Lack of Development in Reasoning, Critical Thinking, and Problem-Solving Skills:

Digitalization allows students to acquire knowledge about subjects with extreme ease. Consequently, there is limited scope for the development of their critical thinking, reasoning abilities, and problem-solving skills.

4. Lack of Social Development:

The digitized education system offers significantly fewer opportunities for social interaction; as a result, comprehensive social development is often not possible.

5. Moral Development:

One of the most crucial prerequisites of education is the cultivation of various moral qualities within students. Since this system minimizes opportunities for interaction with peers, teachers, and others, the development of these moral attributes is often stunted.

6. Various Obstacles:

To effectively implement the process of digitalization in education, it is essential to have reliable access to electricity, mobile devices, computers, and similar infrastructure. In our country, however, many rural areas still face persistent issues regarding electricity supply. Furthermore, many students still lack access to mobile phones or computers; in such instances, this system creates significant difficulties.

7. Lack of Trained Teachers:

Implementing the digitalization of education requires the expertise of trained teachers. Unfortunately, our country still faces a shortage of educators equipped with the necessary training for this purpose. The digital revolution has ushered in profound changes in the field of education.

VII.IMPACT OF DIGITAL REVOLUTION IN EDUCATION

The digital revolution in education has initiated widespread change. Its impacts on education discussed below:

- Accessibility:

Digital technology has removed geographical and socioeconomic barriers, thereby expanding educational opportunities through various learning platforms.

- Personalized Learning:

Digital technology enables learning experiences tailored to the specific needs and capabilities of individual students. Educators can utilize diverse resources and methodologies to accommodate each student's unique learning style and pace.

- Use of Digital Tools:

Educators employ digital tools to make the teaching-learning process significantly more interactive and engaging.

- Cost-Effective Education:

The digital revolution has substantially reduced the cost of education. Educational institutions can achieve significant financial savings by utilizing online learning platforms and digital resources.

- Skill Enhancement:

The use of digital technology allows students to acquire proficiency in technology-related skills. It fosters the development of competencies such as information retrieval, data analysis, and computer programming.

- Improved Communication:

The integration of digital technology in education has vastly expanded opportunities for communication between teachers and students.

- Collaborative Learning:

The digital revolution has facilitated advancements in collaborative learning. In this environment, students actively participate in the teaching-learning process and cultivate a mind set geared toward teamwork.

- Collective Learning:

The digital revolution has fostered the development of collective learning. This approach involves two or more students sharing their respective learning resources and skills with one another; essentially, they remain mutually interdependent and accountable to one another.

- Global Educational Opportunities:

The digital revolution has created worldwide educational opportunities, enabling students to acquire knowledge within an international context.

- Creativity and Innovation:

The digital revolution plays a pivotal role in fostering creativity and enhancing the innovative capabilities of both teachers and students.

In conclusion, the digital revolution represents a transformative shift in education, significantly enhancing both the quality and efficacy of learning. It curates an enriched educational experience for students and effectively prepares them for the future.

VIII.ROLE OF A TEACHER IN DIGITAL REVOLUTION

The role of a teacher in the digital revolution has shifted from a primary source of knowledge to a facilitator, mentor, and curator of learning.

The role of a teacher in the digital revolution has changed significantly. The role of a teacher has shifted from a primary source of knowledge to a facilitator, mentor, and curator of learning. Teachers are no longer just knowledge providers—they are guides, facilitators, and innovators. Here are the key roles:

1. Facilitator of Learning

Teachers guide students to find, understand, and use information from digital sources instead of only giving direct instruction.

2. Technology Integrator

They use tools like smart boards, online platforms, videos, and educational apps to make learning more engaging and interactive.

3. Content Curator

Teachers select reliable and useful digital content from the vast amount of information available on the internet.

4. Skill Developer

They help students develop important 21st-century skills such as critical thinking, creativity, collaboration, and digital literacy.

5. Mentor and Guide

Teachers support students emotionally and academically, helping them use technology responsibly and effectively.

6. Lifelong Learner

In the digital age, teachers continuously update their knowledge and learn new technologies to stay relevant.

7. Classroom Manager in Digital Environment

They manage both physical and virtual classrooms, ensuring discipline and active participation in online learning.

8. Promoter of Inclusive Education

Digital tools help teachers reach diverse learners, including students with different abilities and learning needs.

IX.CONCLUSION

Digital Revolution has brought significant changes in the field of education. Through digital technology, teaching and learning have become easier, more attractive, and more effective. This revolution helps in developing students' creativity, critical thinking, and problem-solving abilities. Teachers also use modern tools and techniques to make lessons more interactive and interesting. However, along with its advantages, there are some challenges.

Currently, the entire world has become acquainted with digital system. While efforts are certainly underway to advance the education system through Artificial Intelligence, this very system risks rendering human beings increasingly mechanical. Digitalization presents challenges in fostering various beneficial emotional responses and in facilitating the socialization of moral values. Excessive dependence on digital devices may reduce face-to-face interaction and affect social values

The 2019 report by the International Commission on Education also explicitly states that digitalization—or technological systems — should under no circumstances be adopted as a substitute for face-to-face instruction.

Therefore, to keep pace with present civilization and scientific technology, importance must be given to digitalization in education in this age of artificial intelligence. The focusing point is a balanced use of both digital and traditional methods necessary for the overall development of students. Further researcher shall be focused on how digital technology can support students with special needs. Investigator shall explore their knowledge on how digital learning affects pupils' creativity, critical thinking, and social behavior in the long run.

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