

# Multimedia Education for Inclusive Development: Exploring NCERT's Open-Access Initiatives in India's School Education System

Pooja Jain<sup>1</sup>, Garima Dalal<sup>2</sup>& Parveen Babbar<sup>3</sup>

<sup>1</sup>Assistant Librarian, Library & Documentation Division, National Council of Educational Research and Training, (NCERT), New Delhi

E-mail: poojajain18nov@gmail.com

<sup>2</sup>Associate Professor, Linguistic Empowerment Cell, Jawaharlal Nehru University, Delhi

<sup>3</sup>Deputy Librarian, Dr. B. R. Ambedkar Central Library, Jawaharlal Nehru University, Delhi

## Abstract

*The foundation for realising the national objective of a developed country rests on the provision of School Education. India's school education system is the world's largest, with a growing youthful population contributing to its potential for development. As a result, guaranteeing education accessible to everyone and providing multiple modes of access to educational resources for students and teachers have significant challenges and concerns.*

*Several national-level organisations have taken numerous initiatives to enhance the quality of school education. This paper aims to elucidate the availability of multimedia content for disseminating and reaching all levels of school education. This study focuses on open-access materials developed and coordinated by NCERT. This research aims to bring to light the existence of e-content accessible to all stakeholders, such as students, teachers, parents, and educators in school education, which a trustworthy national institution in India has created.*

**Keywords:** E-Content, Multimedia, School Education

## Introduction

In the contemporary era of Information and Communication Technology (ICT), e-content has emerged as a prominent trend for teaching and learning, even in school education. E-content is a form of digital content accessible via the internet and can be accessed at any time and from any electronic device with internet connectivity. This learning material encompasses different multimedia formats, including text, audio, video, audio-visual, graphics, and slides, designed to facilitate and enhance educators' and students' teaching and learning processes.

Numerous resources are available for various stages of school education through open-access platforms developed by diverse institutions and government bodies, ensuring equal access to fundamental materials and fulfilling the objective of Education for All. In the Indian education landscape, e-content has become a significant trend for school education, incorporating multimedia elements like text, videos, animations, simulations, and interactive components. The advantages of e-content include accessible learning materials for diverse student populations, enhanced engagement

and interactivity, personalization and differentiation, augmenting teacher effectiveness, bridging socio-economic divides, and national initiatives. E-Content has revolutionized the way teaching and learning occur in schools, enhancing educational outcomes and fostering a more inclusive and equitable education system in India.

## Literature Review

The NCERT has embarked on a transformative endeavour through an open-access initiative, aimed at fostering inclusive development within the Indian school education system. Utilizing multimedia education, effectively dismantles barriers and improves accessibility, ensuring that high-quality educational resources are made available to students across the entirety of the country, regardless of their diverse needs. The NCERT's forward-thinking approach in providing such open-access resources is a commendable step towards promoting inclusive education for both students and educators alike. According to Monika et al. (2023), multimedia provides a platform for revolutionising traditional educational methods by enhancing learning materials through visually appealing presentations, and educational videos which cater to the diverse learning styles of the learners. This further expands to facilitating remote education through the usage of virtual learning environments on online platforms and interactive software. These platforms using multimedia elements provide a comprehensive evaluation of understanding for the students. Further, the paper discusses the use of multimedia in education to enhance teaching and learning, through technology, diverse content, interactivity, and accessibility. Virtual Reality and Augmented Reality can provide immersive learning experiences. Artificial Intelligence can personalize

learning. Gamification techniques can increase motivation. Mobile technologies enable flexible learning. Cloud computing promotes accessibility and collaboration. Interactive white boards and touchscreens facilitate engagement. Adaptive learning systems personalize instruction and provide feedback.

Abdul Rahaman et al. (2020) iterate that "Multimedia or digital learning resources assist learners to get on well with mental representations with the use of different media elements, which support information processing". Quality education is not easily accessible in developing countries, but multimedia technology can help overcome this challenge. This review examines various multimedia tools used in teaching and learning, including developing new tools, evaluating their impact, and exploring emerging technologies. The success of these tools is attributed to their technology and components, with a focus on pedagogical content and user audience. Future research should examine the role of teachers in facilitating their use and their scalability and sustainability in different educational contexts. As cited from Abdulrahman et al. classify multimedia technology for educational purposes based on its use in teaching or learning; Eady and Lockyer (2013) list different multimedia and digital learning resources, emphasizing their importance in education; Guan et al. (2018) highlight the significance of multimedia technologies in education, as emphasized by Almara'beh et al. (2015). The benefits of multimedia tools for teaching and learning include transforming abstract concepts into concrete content, presenting large volumes of information efficiently, stimulating student interest, and providing insights into students' learning positions.

Multimedia for learning involves constructing mental representations

from words and pictures across different contexts. This design includes tools for presentations, classroom or laboratory learning, simulations, e-learning, computer games, and virtual reality. Alemdag and Cagiltay (2018) stress the importance of cognitive theory in multimedia learning. This theory assumes dual-channel, limited capacity, and active processing. Dual-channel recognizes learners' ability to separate visual and auditory information; limited capacity acknowledges data processing constraints, and active processing asserts learners' active role in selecting, organizing, and integrating information. This understanding helps teachers deliver effective multimedia learning experiences without overwhelming learners.

Multimedia is disseminating e-content in various formats, such as text, audio, video, animations and images. This interactive medium facilitates two-way communication between educators and students. In the early stages of the computer era, the content was stored on Floppy Disks, then on CD-ROMs, CD R-Ws (Rewritable Compact Disks), Pen Drives, Hard Drives, and email storage, and has now advanced to Cloud Storage. The technological landscape offers a plethora of alternatives. However, the diffusion of technology is a gradual process, and sometimes a significant environmental change can trigger a surge in a particular technology. Google Meet is a prime example of a technology that experienced a surge in usage during the pandemic and has now become a crucial part of our professional and educational pursuits in the post-COVID era.

A diverse range of definitions for Multimedia exist. The website GeeksforGeeks mentions, that multimedia "refers to the computer-assisted integration of text, drawings, still and moving videos, graphics, audio, animation and any other media in

which any type of information can be expressed, stored, Communicated, and processed digitally" (GeeksforGeeks, 2024).

In the context of Indian multimedia used in school education and e-content, the two types, interactive multimedia, and non-interactive multimedia, play distinct roles in enhancing the teaching and learning experience (Anderson, 2019).

### **Interactive Multimedia:**

Interactive multimedia refers to content that allows users, such as students and teachers, to actively engage with the material and participate in the learning process. This type of multimedia facilitates dynamic interactions, enabling learners to control the pace and direction of their learning. In the Indian education system, interactive multimedia has gained significant traction due to its ability to cater to diverse learning styles and promote active learning. It includes virtual simulations, gamification, collaborative learning, and personalized learning paths. Gamification increases participation and retention, while collaborative tools encourage teamwork and communication. Personalized learning platforms adapt to individual progress, strengths, and weaknesses.

### **Non-Interactive Multimedia:**

Non-interactive multimedia, on the other hand, is content that presents information in a static or linear format, where users have limited or no control over the flow of the material. While it may not offer the same level of engagement as interactive multimedia, it remains a valuable component in Indian school education, especially for delivering information efficiently. Four ways in which non-interactive multimedia is utilized are video-based learning, audio content, e-books and digital texts, and infographics and presentations.

These resources offer visual aids, demonstrations, expert insights, accessibility, portability, easy access, multimedia elements, and concise and visually appealing presentations.

In the context of e-content, both interactive and non-interactive multimedia play crucial roles in transforming traditional teaching methods in Indian schools. Educators and content creators are continually exploring innovative ways to leverage these multimedia formats to create engaging, accessible, and effective learning resources. As technology continues to advance, the integration of multimedia in Indian education is expected to further evolve, enriching the learning journey and contributing to a more inclusive and comprehensive education system.

The principal aim of multimedia content is thus to serve as a means for self-directed learning, enhance the appeal of subjects, reinforce classroom-based pedagogy, and foster an engaged pattern of student learning. A multimedia platform removes physical and psychological barriers, like in the case of a traditional teaching environment, where the learning effectiveness of a lesson solely depends on the teacher's performance and teaching strategies. These platforms help the students by providing a chance to see the content again and repeatedly when required to clear the topic/concept/subject.

The utilisation of this technologically advanced tool has had a ground-breaking impact on the process of pedagogy at the academic level. However, as a consequence, an urgent need has arisen to authenticate the veracity of the material available on the internet. The internet presents a confluence of counterfeit and genuine information, thus making it imperative for the Indian government to guarantee the credibility of the content by

relying on sources such as national organisations like NCERT, NIOS, CBSE, etc. Moreover, this tool facilitates continuous learning and improvement by enabling swift feedback and allowing students to access PowerPoint presentations for note-taking and examination purposes. In the current era, PowerPoint presentations (PPT) have emerged as a crucial resource for generating and disseminating content among students. These resources, available in various formats, can also be utilised by parents to teach their children at home. Considering the technological advancements of the era, it has become imperative to integrate information and communication technology (ICT) at all levels with the aim of creating, receiving, sharing, and utilising knowledge without any bias towards caste, religion, race, gender, or financial status for the purpose of social, economic, financial, and cultural development. The incorporation of e-content as a powerful pedagogical resource transforms and reinforces teaching methodologies through the facilitation of broader sharing and dissemination.

### **Benefits of the e-Content**

- Multiple user access at the same time
- Cost-effective in terms of routine maintenance and preservation for future use
- Longevity as there is no shelf-life of e-content; it can be preserved in a variety of ways for generations with the advent of new technologies
- Content is intended to be used by the teaching community, students and parents
- The uploaded content can be accessed by an unlimited number of users worldwide simultaneously

## Drawbacks of the e-Content

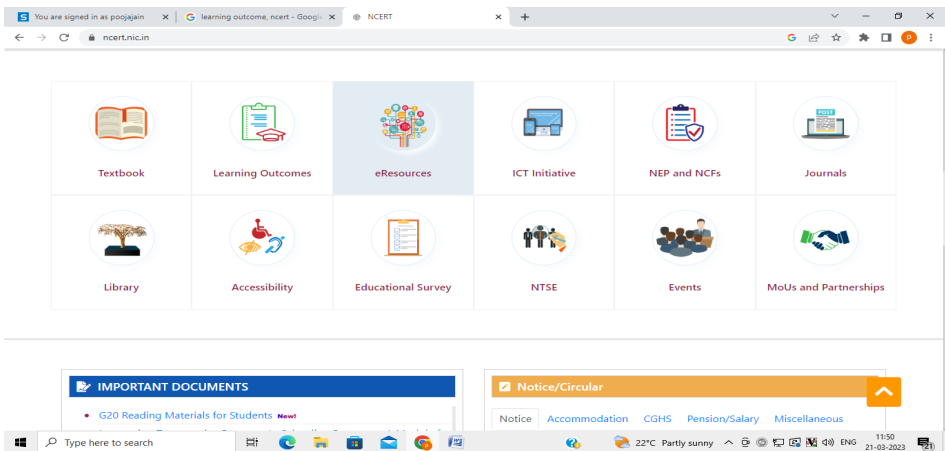
- Electronic gadgets and an internet connection are basic requirements for e-content access.
- Increased screen time may adversely impact children
- Cost is a hindrance for the underprivileged population of India and remote areas
- The on-the-spot study is compromised when students rely on the fact that everything is available on the school portal
- Split attention among children is on the rise as children over-access multimedia content

The emergence of e-content has ushered in a new era of digital learning in the field of Indian school education, providing numerous advantages such as accessibility, cost-effectiveness, and

global reach. However, in order to fully capitalize on its potential, it is vital to address the obstacles associated with digital infrastructure, screen time, and just distribution of resources. Through a balanced and comprehensive approach to the incorporation of e-content, India can pave the way for a more dynamic and equitable educational landscape, thereby empowering both learners and educators in their quest for knowledge and progress (Mishra, Patel and Doshi, 2017).

## E-Content for School Education in a variety of formats by NCERT:

The National Council of Educational Research and Training (NCERT) is a government entity that operates within the realm of primary and secondary education as well as pre-service and in-service teacher education. The NCERT website currently offers a plethora of educational resources and materials.



(Screenshot for the e-Content developed and coordinated by NCERT)

## For Students:

1. **Syllabus** - The syllabus serves as the foundation for any course preparation and holds significant importance. Within this link, one may find the syllabus for elementary

levels (grades I to VIII) contained within volume one. Furthermore, syllabi for secondary and higher secondary classes are available and can be accessed in a grade-wise and subject-wise manner, providing a multilingual experience in English,

Hindi, and Urdu languages (NCERT Syllabus, 2024).

2. **E-books:** This online platform comprehensively archives all academic literature, including textbooks, reference materials, and other vital resources crucial for teacher training. Within the e-book section, one can acquire school textbooks aligned with the National Curriculum Framework of 2005, spanning from grades I through XII, conveniently accessible in PDF format. Furthermore, this platform streamlines obtaining and printing individual chapters as needed (NCERT E-books, 2024)
3. **Flipbook:** The flip book, a collection of pages of a book in sequential image format, is capable of being read and viewed in a manner similar to that of a tangible book. Inclusive of English, Hindi, and Urdu language options, all textbooks in PDF format are also made available in flipbook form for classes I through XII. The flip book may be accessed via the aforementioned link or the E-Pathshala application that can be downloaded from the Play Store (NCERT ePathsala, 2024).
4. **Audio Books: Audio books** are a format that has garnered widespread popularity and has found significant use in the context of class I to XII education (CIET, 2024). These audiobooks are designed to provide a chapter-wise listening experience to students, allowing them to engage with the content more dynamically. Furthermore, a considerable number of audiobooks are available on YouTube, which spans approximately 130 different titles. These audiobooks cover a range of famous personalities and are available in Hindi, ranging from 15 to 25 minutes. (NCERT Youtube, 2024)
5. **State/UTs Textbooks:** NCERT provides state textbooks of some states, such as Haryana, Delhi, Uttar Pradesh, Andhra Pradesh, and Mizoram (NCERT Ebooks of States/ UT, 2024).
6. **Material on Vocational Education:** The National Council of Educational Research and Training (NCERT) has a dedicated institute, the PSSCIVE, which focuses on vocational education. The PSSCIVE website (<https://psscive.ac.in/publications>) provides syllabuses, textbooks, and other educational materials on vocational education for students in grades IX to XII, covering various vocational subjects at both secondary and higher secondary levels.
7. **NCERT YouTube Official channel:** For audio and audio-visual content related to academic subjects, as well as national programs, live training sessions, counselling sessions, and audiobooks, the best source is the NCERT YouTube Official channel (<https://www.youtube.com/@NCERTOFFICIAL>). With more than 17,000 videos and 1.1 million subscribers, this channel offers a wide variety of videos on all subjects, from subjective videos to career counselling. It is a valuable resource for reaching the massive population of India and bridging the digital divide to provide quality and equal education for all, with only the internet and smartphones.

### **For Teachers, Researchers, Policy makers, Teacher educators and other stakeholders of Education:**

#### **1. Policies & Frameworks**

- **National Policy on Education:** National Policy on Education (NEP) 1986 with the modified version in 1992 is accessible through this link.

The NEP 2020 (66 pages) document is also available in Hindi and English. This document can be disseminated through an audio format for broader outreach (NCERT NEP, 2024).

- **NCF and XXI National Focus Group Position Papers:** NCERT facilitates in obtaining the complete texts of National Curriculum Frameworks (NCF) and 21 National Focus Group position papers in Hindi and English Language (NCERT-NCF, 2024).
- 2. **Journals:** Currently, there are a total of eight journals published by NCERT that are available in open access in full-text form, beginning from the year 2010. Two of these eight journals, namely Voice of Teachers & Teacher Educators and the Indian Journal of Educational Technology, were produced after the year 2015 (NCERT Journals, 2024).
- 3. **Educational Survey:** NCERT surveys and analyses through the National Achievement Survey, All India School Education Survey, and the most current Foundational Learning Study reports. These surveys are highly beneficial for facilitating research at all levels of school education (NCERT Educational Survey, 2024).
- 4. **Learning Outcomes:** Learning outcomes represent the quantifiable and measurable objectives that evaluate student learning performance at distinct educational stages. These objectives encompass published benchmarks for elementary and secondary education and draft benchmarks for higher secondary education. In particular, learning outcomes at the elementary stage are available in three languages: English, Hindi, and Urdu (NCERT Learning Outcomes, 2024).

5. **Resources for Inclusive and Equitable Education:** There exists a diverse range of resources at one's disposal to enable personalised adaptive learning as per the initiatives implemented by the National Council of Educational Research and Training (NCERT) for Social-Economic Disadvantaged Groups (SEDGs) under the National Education Policy (NEP) of 2020. Additionally, such measures have been taken to cater to the educational requirements of children with special needs to provide equal access to education for all (NCERT Accessibility, 2024). For instance, there exists a mobile application that enables the auditory consumption of NCERT textbooks. Another innovative tool is PRASHAST, a disability screening checklist custom-made for schools. Barkhaa is a unique reading series based on UDL that caters to the needs of all learners. Furthermore, there are teaching and learning resources available in Indian Sign Language (ISL) as well as Bhasha Sangam, a platform that provides education in 22 scheduled Indian languages and Indian Sign Language. Additionally, teacher support material on inclusive education is accessible to those who require it. Lastly, there are tactile map books that serve as a valuable resource for the visually impaired.

**Other Documents:** The latest significant materials can be accessed on the homepage of NCERT, specifically under the heading 'Important Documents'. The collection of materials comprises novel additions such as G20 reading materials intended for students, Draft of Integrating Transgender Concerns in the Schooling process: a module designed for school staff, Guidelines for Vidya Parvesh (Three Month Play-based School Preparation for Grade-I),

National Curriculum Framework for Foundational Stage for 2022, Handbooks, Training and Resource material on Health and Wellbeing, Cyber Safety and Security, Counselling Services (Region wise), and more.

**Other Initiatives:** The MOE-Government of India has implemented several initiatives under the aegis of NCERT to augment the teaching-learning experience for educators and students. These include DIKSHA, a digital infrastructure that fosters knowledge sharing; NISHTHA, which seeks to enhance the overall advancement of school heads and teachers; SWAYAM, an online course platform; and the Swayam Prabha TV channel. Such endeavours aim to elevate the calibre of education.

## Conclusion

School Education serves as the fundamental basis for each education system. The National Council of Educational Research and Training (NCERT), an eminent apex organization operating under the Ministry of Education (MOE) of the Government of India, has been striving to enhance the quality of school education. In recent times, this organization has been particularly focused on innovating and disseminating progressive educational techniques and practices, while ensuring that educational resources are interactive, user-friendly, and accessible globally, 24X7. The NCERT is renowned for its noteworthy contribution in

developing various National Curriculum Frameworks, syllabi, and textbooks, alongside supplementary material, for teaching purposes. Currently, the National Council of Educational Research and Training (NCERT) is creating a new National Curriculum Framework (NCF) to align with the National Education Policy (NEP) 2020. The NCF is crucial in guiding curriculum development, teaching, and evaluation practices in India's education system. The framework aims to foster holistic development, critical thinking, and creativity among students by incorporating a novel approach of 5+3+3+4 that covers the Foundational, Preparatory, Middle, and Secondary levels. The NCF emphasizes play-based and activity-oriented learning for foundational learners, experiential and discovery-based learning for preparatory learners, a flexible and multidisciplinary curriculum for middle learners, and specialized and in-depth study for secondary learners. The framework promotes learner-centric pedagogies, digital and technology-enabled learning, interdisciplinary knowledge acquisition, and the inclusion of art, culture, and sports to advance holistic development. The successful implementation of the NCF will lead to an inclusive, relevant, and empowering educational experience for students nationwide. Additionally, it serves as a crucial nodal point for the production, organization, and dissemination of teaching and learning e-resources, catering to a vast target group of users in the fields of School Education and Teacher Education.

## References

- Almara'beh, H., Amer, E.F., Sulieman, A., 2015. The effectiveness of multimedia learning tools in education. *Int. J. Adv. Res. Comput. Sci. Software Eng.* 5 (12), 761–764.
- Anderson, Jason, 2019. *School education system in India: an overview*. Delhi: British Council. Retrieved from <https://www.academia.edu/40029175>
- CIET, 2024. CIET Audiobooks. Retrieved from <https://ciet.nic.in/pages.php?id=audiobook&ln=en>



Eady, M.J., Lockyer, L., 2013. "Tools for Learning: Technology and Teaching Strategies," Learning to Teach in the Primary School. *Queensland University of Technology*, Australia, p. 71.

GeeksforGeeks, 2024. What is Multimedia. Retrieved from <https://www.geeksforgeeks.org/what-is-multimedia>

Guan, N., Song, J., Li, D., 2018. On the advantages of computer multimedia-aided English teaching. *Procedia Comput. Sci.* 131, 727–732, 2018.

Mishra, Urvashi, Patel, Sarjoo and Doshi, Khyati, 2017. E-content: an effective tool for teaching and learning in a contemporary education system. *International Journal of Advance Research and Innovative Ideas In Education* 2(1):79-83

Monika, et al. 2023. Scope and Challenges of Multimedia in Education Sector. *International Journal for Multidisciplinary Research*, vol. 5, no. 3, *International Journal for Multidisciplinary Research (IJFMR)*, June 2023. Crossref,<https://doi.org/10.36948/ijfmr.2023.v05i03.3868>.

Musbau, Dogo, Abdulrahaman., et al. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, 6(11) doi: 10.1016/J.HELIYON.2020.E05312

NCERT, 2024. NCERT Accessibility. Retrieved from <https://ncert.nic.in/accessibility.php>

NCERT, 2024. NCERT E-books of States/UT. Retrieved from <https://ncert.nic.in/state-uts-eBook.php?ln=>

NCERT, 2024. NCERT E-Books. Available at <https://ncert.nic.in/ebooks.php?ln>

NCERT, 2024. NCERT Educational Survey. Retrieved from <https://ncert.nic.in/educational-survey.php>

NCERT, 2024. NCERT ePathsala. Retrieved from <https://epathshala.nic.in//process.php?id=students&type=eTextbooks&ln=en>

NCERT, 2024. NCERT Journals. Retrieved from <https://ncert.nic.in/journals-and-periodicals.php>

NCERT, 2024. NCERT Learning Outcomes. Retrieved from <https://ncert.nic.in/learning-outcome.php>

NCERT, 2024. NCERT National Curriculum Frameworks. Retrieved from <https://ncert.nic.in/focus-group.php?ln=en>

NCERT, 2024. NCERT National Education Policy. Retrieved from <https://ncert.nic.in/nep.php?ln=en>

NCERT, 2024. NCERT Syllabus. Available at <https://ncert.nic.in/syllabus.php?ln=>

NCERT, 2024. NCERT Youtube official Channel. Retrieved from [https://www.youtube.com/watch?v=FSfvWMICG34&list=PLB6bRJWWWy5\\_9kz8P7mzpmNvy24EdAg7O&index=6](https://www.youtube.com/watch?v=FSfvWMICG34&list=PLB6bRJWWWy5_9kz8P7mzpmNvy24EdAg7O&index=6)