

Integration of Educational Technology and Sdg 4 In Nep 2020: A Review Study

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ABSTRACT

The National Education Policy (NEP) 2020 is going to transform the whole education system of India by ensuring 21st-century education which aligns with the Global target of Sustainable Development Goals (SDGs). In the year 2015, the United States came up with the framework of Sustainable Development Goals (SDGs) which is the agenda of action for people, plants and prosperity. Both the frameworks have their common goals, NEP 2020 going to foster India's education system to align with the global target (SDG 4) effectively. To achieve these targets, today's world demands for integration of technology in education. This paper explores the areas of emphasis on SDG 4 as envisioned by NEP 2020 and also explores the role of educational technology in achieving SDG 4 as envisioned by NEP 2020. This study is based on descriptive analysis method to analyze the whole NEP 2020. With the approach of SDG 4, NEP 2020 fosters the global vision towards equality, quality, equity, and inclusivity in education system in India. This collective step can build a brighter future through education by encouraging necessary 21st-century knowledge and skills to navigate the new world.

Keywords: National education policy 2020; Sustainable development goals; Sustainability; Technology; Education, Educational technology

1. Introduction

1.1. Sustainable Development Goals (SDG)

“Education can, and must, contribute to a new vision of sustainable global development.”
(UNESCO, 2015)

In the scenery of world education policy, the alignment between the international agenda and national agenda should be essential for attaining sustainable development. Sustainable Development Goals are the outline to achieve a better sustainable opportunity for all. The 17 Goals are all interrelated, and in order to leave no one after, it is important that we achieve them all by 2030 (UN, 2023). All the countries are expected to frame their policies over the next 15 years to end poverty, protect the planet, enjoy peace, and ensure success for all. In September 2015, India along with 193 countries adopted a global development vision called Transforming our World: The 2030 Agenda for Sustainable Development. This agenda

mainly focus on people, planet and prosperity. The idea of SDGs initiated for the first time at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The SDGs build on the success of the Millennium Development Goals (MDGs) and seek to utilize the progress of MDGs and complete what they did not attain ([Sustainable Development Goals and Gram Panchayats: Handbook for Trainers and Gram Panchayats, UNDP, 2016](#)).



Figure 2: Sustainable Development Goals (SDGs, 2030)

(Source: www.researchgate.com)

1.2. Sustainable Development Goal 4 (SDG4)

SDG4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All

Sustainable Development Goal 4 (SDG 4) includes a set of international goals, targets at ensuring inclusive and equitable quality education for all. The specific targets and objectives under SDG 4 ([UN; Sustainable development goals, Goal 4](#)) which are mention bellow:

Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

Target 4.2: By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

Target 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university

Target 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

Target 4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

Target 4.6: By 2030, ensure achieve literacy and numeracy for all the youths and a substantial proportion of adults, both men and women.

Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Target 4.a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

Target 4.b: By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, Small Island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries.

Target 4.c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and Small Island developing States.

Mention all these targets collectively highlight the transformative power of education in achieving sustainable development and construction of inclusive and equitable global society. The target date for achieving SDG 4, along with the other Sustainable Development Goals, is 2030 (UN; SDG: Goal 4). Education is essential for achieving full human potential, developing an equitable and just society, and promoting national development. NEP 2020 proposed the revision of all aspects of the education structure, including its regulation and governance, to create a new system that is aligned with the inspirational goals of 21st century education, including SDG 4, while building upon India's traditions and value systems (NEP, 2020).

1.3. National Education Policy 2020 (NEP)

National Education Policy 2020 is the foremost education policy of the 21st century and aims to attend to the many rising developmental imperatives of our country. It is based on the principle that education should develop not simply cognitive capacities - both the 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities. This guiding principle modified with a new pedagogical and curricular streamlining of 5+3+3+4 covering ages 3-18. At present, children in the age group of 3-6 are not enclosed in the 10+2 structure as Class 1 begins at age 6. In the new 5+3+3+4 structure, a well-built base of Early Childhood Care and Education (ECCE) from age 3 is included, which is aimed at promoting overall learning, development, and well-being ([NEP, 2020](#)). NEP 2020 defines 5 pillars such as: Equality, Equity, Quality, Accessibility and Affordability. The guiding principle also promotes inclusive and equitable education, cut the gender gap, and provides universal access to quality education for all. The well-organized accomplishment of NEP 2020 will have need of strong teamwork between the central and state governments also education stakeholders and civil society ([Patil, 2022](#)).

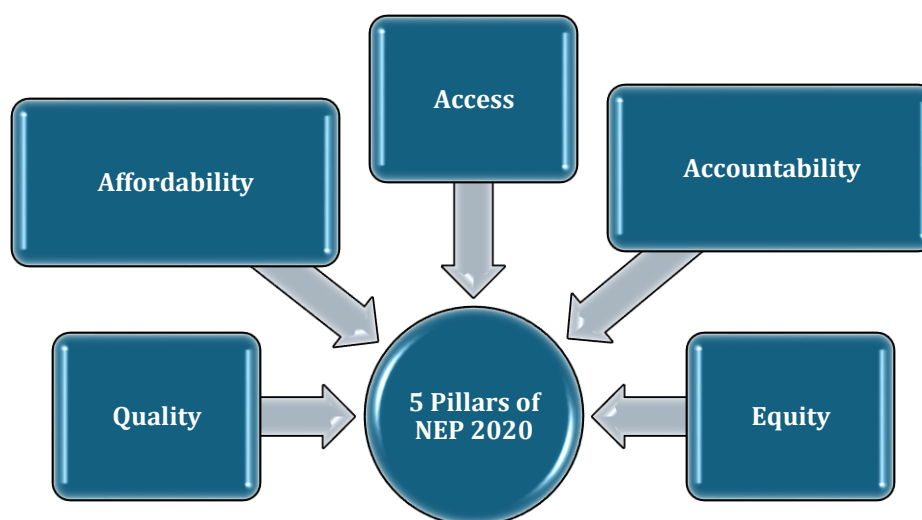


Figure 3: 5 Pillars of NEP 2020

1.4. Alignment of SDGs towards NEP 2020

The Sustainable Development Goals (SDGs, 2030) and the National Education Policy 2020 (NEP 2020) are both vital roadmaps that intend to improve the entire world and people lives. SDG 2030 comprises total 17 goals out of which the majority of the goals will be able to attain if quality education will be provided to children. The foundation of NEP 2020 is also talked about quality education which directly or indirectly helps in achieving SDGs by 2030 ([Patil, 2022](#)). By aligning the SDGs and NEP 2020, education can be distorted to become more significant, equitable, and sustainable, preparing learners to be accountable global citizens who can contribute to a enhanced future for all ([Radha & Arumugam, 2023](#)).

2. Review of Related Literature and Research Gap

In this part, investigators explored the various research works related to the National education Policy (NEP) 2020 and it's alignment with sustainable development goal (SDG) 4. The Sustainable Development Goals (SDGs) is one the global framework and most prominent research area in the 21st century world. To achieve the global target education and technology both are playing the vital role therefore, India come with first 21st century education policy align with SDGs. This literature review helps the authors to understand the current research area and works in an effective way.

Research conducted by Tushar Dhar Shukla et al. ([2023](#)), found that the India's NEP 2020 and the United Nations' SDGs make known a promising convergence of objectives. By fostering a culture of vibrant policy evolution based on evidence and feedback, India can diagram a pathway toward a brighter, more equitable, and sustainable potential for its citizens. PappuLal Gupta & Meetha Lal Meena ([2024](#)) stated that NEP 2020 is the ambition to universalize education from pre-school to secondary level, a goal that aligns with SDG 4, which emphasizes inclusive and equitable quality education and encourage lifelong learning opportunities for all. L. Radha & J. Arumugam ([2023](#)) found that NEP 2020 and the SDGs contribute to familiar objectives related to promoting access to quality education, improving

learning outcomes, and promotion innovation and research. Divya Sharma (2024) further emphasized, NEP 2020, India's futurist policy, aligns with the principles of SDG 4, reflecting a obligation to transformative reforms in the education segment . Seema A. Patil (2022) found that NEP 2020 is based on the philosophy of access, equity, quality, affordability, and accountability in education. By making both school and college education more inclusive, flexible, and suitable to the needs of the 21st century, NEP 2020, which is allied with the 2030 agenda for Sustainable Development (SD), intends to transform India into a dynamic knowledge society and worldwide knowledge superpower.

Anshika Kasana & Shalini Saxena (2024) mentioned in their study that the combination of technology within the educational framework, promoting digital literacy and facilitating access to online learning resources to democratize education. Dhani Ram (2021) stated that technology itself will play an significant role in the upgrading of educational processes and outcomes; thus, the association between technology and education at all levels is bidirectional.

Paraschos Maniatis (2024) concluded that sustainability education can be an efficient tool for promoting sustainable development. Policymakers and practitioners should provide in sustainability education programs and initiatives to assist students build up the knowledge, attitudes, and behaviors needed to assemble a more sustainable future. Nipunta Kaur & Jasvir Kaur (2024) stated that by aligning NEP 2020 with the SDGs and addressing various challenges, India can make sure that its education system not only meets the requirements of the 21st century but also contributes considerably to global sustainable development. Investing in technological innovations in education will help construct a more inclusive, equitable, and sustainable world for future generations. Prakriti James & Priyalata Pandey (2024) further emphasized that National Education Policy (NEP) 2020 in India advocates for the incorporation of technology in education to transfigure learning methodologies and promote inclusive education. The policy underscores the significance of teacher training in technology integration and the establishment of vigorous digital infrastructure in educational institutions.

2.1. Research Gap

After reviewing the various research papers, documents, books investigators understand the current scenario of research Gap. A lot of research already has done in the area of NEP 2020 and in relation to education technology. But every few have done in the context of sustainable education goals (SDG). In the SDG 4, talk about “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” which is highly aligns with NEP 2020. To achieve the target of SDG 4 by 2030, it is necessary to implement it effectively, in that case educational technology play a vital role to make education ore equitable, accessible, quality for all. Therefore, the investigators decide to explore it through this study.

2.2. Research Questions

This study is focused on the following research questions:

- I. How NEP 2020 has aligned SDG 4 across the education system?

II. How would NEP 2020 achieve SDG 4 through the use of educational technology?

2.3. Research Objectives

This study is focused on the following research objectives:

- I. To discuss the areas of emphasis on SDG 4 as envisioned by NEP 2020.
- II. To explore the role of educational technology in achieving SDG 4 as envisioned by NEP 2020.

2.4. Significance of the Study

The National Education Policy (NEP 2020) is a blueprint for the 21st century India. A study conducted by Kirmani, J. O. et al. (2024) found that “The National Education Policy (NEP) 2020 marks a major milestone in India's educational framework which aims to revitalize and transform the nation's education system by aligning NEP 2020 with the Sustainable Development Goals (SDGs)”. Radha, L., & Arumugam, J. (2023) stated that “Both the NEP 2020 and the SDGs share the common objectives of promoting quality education, boosting learning outcomes, and fostering innovation and research”. Research by Kaur, N. and Kaur, J. (2024) found that “The integration of technology in education has become a key factor in fostering progress towards Sustainable Development Goals (SDGs)”. According to Patil, A. S. (2022), “Education for sustainable development is a continuous learning process a vital component of quality education”. The new National Education Policy 2020 and Sustainable Development Goal 4 share the goals of universal quality education and lifelong learning. The major demand of the 21st century new India and evolving research area like this, the investigators decided to analyze the alignment of the New Education Policy 2020 (NEP) with SDG 4: Quality Education and the role of educational technology while achieving SDG 4 in the frame of NEP 2020. So that, India can achieve the target of SDGs by 2030 in the light of NEP 2020.

2.5. Conceptual Framework of the Study

The present study seeks to explore how SDG 4 as envisioned by NEP 2020 and also explores the role of educational technology in achieving SDG 4 as envisioned by NEP 2020 for better understanding of the research area, investigators go through the Sustainable Development Goals (SDGs) report, National Education Policy (NEP) 2020 and their provisions regarding educational technology. Among the 17 goals, SDG 4 (Quality Education) aims to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. Like other countries, India also targets to attain the SDGs by 2030. At the same time, India comes with first 21st-century education policy known as National Education Policy 2020 (NEP). NEP 2020 addresses significant issues, including curriculum modification, pedagogical modernization, technological assimilation, and equitable access to education. The policy's implication lies not only in its potential to outline the future of India's education system but also in its ability to align the nation's with global agendas, including the SDGs. NEP 2020 encourages a strong vision for transforming education through the integration of technology much as possible in every level of the education system so that each and everyone can access and afford quality education across the country.

By mapping this framework, the study helps to explore how the integration of educational technology as envisioned in NEP 2020 contributes to achieving the global targets of SDG4, especially in terms of reducing inequalities in access to education, improving learning outcomes and fostering digital literacy among citizens of India.

2.6. Methodology of the Research

The present study is based on descriptive analysis method. Descriptive analysis is appropriate to all types of research. Descriptive analysis can be used to analyze issues that demand the immediate attention of policymakers, practitioners, and researchers. It does not describe data; it uses data to describe the world for the reason of identifying and improving our understanding of socially vital phenomena ([Loebet al., 2017](#)). The study, purely based on secondary data which are collected from different secondary sources such as research papers, articles, books, documents, websites and government reports. This paper highlighted SDG 4 in NEP 2020. Along with explore the role of educational technology in achieving SDG 4 as envisioned by NEP 2020 which helps to understand the role of educational technology in promoting the quality of education while achieving SDGs through the light of NEP 2020.

3. Analysis of Findings

Objective 1: To discuss the areas of emphasis on SDG 4 as envisioned by NEP 2020

- *Early Childhood Care and Education (ECCE) or Foundation of Learning*

NEP 2020 introduces a new 5+3+3+4 structure where a strong base of Early Childhood Care and Education (ECCE) from age 3 is included. ECCE highlighting the total provisioning of quality early childhood development, care, and education must be achieved by 2030. It consists of flexible, multi-faceted, multi-level, play-based, activity-based, and inquiry-based learning to ensure universal access for all ([NEP 2020, pp. 7-8](#)). With this target, India will achieve the SDG 4 which talks about equal access to quality pre-primary education to all.

- *Literacy and Numeracy*

In NEP 2020, the highest concern of the education system will be to achieve universal foundational literacy and numeracy in primary school by 2025. A National Mission on Foundational Literacy and Numeracy will be set up by the Ministry of Human Resource Development (MHRD) and all State/UT governments will right away prepare an accomplishment plan for that which mainly focal point on reading, writing, speaking, counting, arithmetic, and mathematical thinking, during the preparatory and middle school curriculum, with a strong system of continuous formative/adaptive assessment to track and ensure each student's learning ([NEP 2020, pp. 8-9](#)). With this action, India is aligning with SDG 4 which leads to universal literacy and numeracy by 2025.

- *Ensuring Universal Access to Education at All Levels*

For aligning with SDG 4, NEP 2020 aims to bring children back to school as early as possible, and to prevent further students from dropping out, with a goal to achieve 100% Gross Enrolment Ratio (GER) in preschool to secondary level by 2030. NEP 2020 propose to provide effective and sufficient infrastructure so that all students have access to safe and

engaging school education at all levels from pre-primary school to grade 12 and tracking students progress very carefully ([NEP 2020, pp. 10](#)).

- *Innovations in Pedagogy and Curriculum*

According to Gupta, L. P. & Meena, L. M.([2024](#)) NEP 2020 introduced the multidisciplinary and flexibility approach in choosing subjects which aligns with the SDGs' broader objective to equip learners with diverse skills required in an ever-changing world. This alignment ensures that education is not just about acquiring knowledge but also increasing a holistic and adaptable skill set. NEP 2020 constructs a new structure 5+3+3+4 where consisting of the Foundational Stage, Preparatory Stage, Middle Stage and Secondary Stage. Therefore NEP 2020 suggest that the aim of education will not only be cognitive progress, but also building personality and creating holistic individuals prepared with the key 21st century skills which fulfill the development of the idea of sustainable development among the students ([NEP 2020, pp.11](#)).

- *Holistic Development of Learners*

To aligning with the SDG 4, every nation should reform their educational curriculum and pedagogy across all the stages. Therefore, India comes with 21st century education policy where India considers that the aim of education will not only be cognitive development, but also creating holistic and well-rounded individuals equipped with the key 21st century skills. NEP 2020 includes all aspects of curriculum and pedagogy will be reoriented to attain these critical goals. NCERT will identify necessary skill sets for early childhood and school education ([NEP 2020, pp. 12](#)).

- *Multilingualism and the Power of Language*

To achieve quality education, NEP 2020 stated that a language does not need to be the medium of instruction for it to be taught and learned well. The three-language formula will prolong to be implemented while keeping in mind the constitutional provisions, aspirations of the people, regions, and the Union. NEP 2020 Indian Sign Language (ISL) should be standardized across the country and national as well as state will develops pedagogical and curriculum materials for use by students with hearing impairment ([NEP 2020, pp. 14-15](#)).

- *Addressing Equity and Inclusion*

NEP 2020's strategies to include marginalized and disadvantaged groups through initiatives like the "Gender Inclusion Fund" and "Special Education Zones" reflect the SDGs' resolve to leave no one behind. This dedication ensures that education acts as a leveling field, offering everyone the opportunity to improve their life conditions and contribute to societal evolution ([Gupta & Meena, 2024](#)). This policy bridging the social category gaps in access, participation, and learning outcomes in school education. NEP 2020 stated a 'Gender-Inclusion Fund' to be built to provide equitable quality education for all girls as well as transgender students across the country ([NEP 2020, pp. 24-26](#)).

- *Affordable Technical, Vocational and Higher Education*

In SDG 4, it is targeted to gives equal access to affordable technical, vocational and higher education to all. NEP 2020 highlights higher education plays a vital role in promoting human

as well as societal wellbeing and notably contributes towards sustainable livelihoods and economic improvement of the nation ([NEP 2020, pp. 33-34](#)). NEP 2020 believed that in alignment with Sustainable Development Goal 4 will help to realize the full potential of India's demographic dividend ([NEP 2020, pp. 43-45](#)). The aim will be to boost the Gross Enrolment Ratio (GER) in higher education including vocational education from 26.3% (2018) to 50% by 2035 ([NEP 2020, pp. 33-36](#)).

- *Towards a More Holistic and Multidisciplinary Education*

NEP 2020 emphasis on holistic and multidisciplinary education, the flexible and innovative curricula of all HEIs shall include credit-based courses and projects in the areas of community engagement, environmental education, and value-based education. Students at all HEIs will be provided with opportunities for internships with local industry, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and further improve their employability. An Academic Bank of Credit (ABC) shall be established which digitally store the academic credits earned from different recognized HEIs. Also, MERUs (Multidisciplinary Education and Research Universities) will be set up to attain the highest global standards in quality education ([NEP 2020, pp. 36-38](#)). They will also help to achieve SDG 4 with the highest standards for multidisciplinary education across India.

- Approach of Equity and Inclusivity

This Policy envisions ensuring equitable access to quality education to all students, with a special emphasis on SEDGs. NEP 2020 highlights the dynamics of SEDGs from the education system should be common across school and higher education sectors ([NEP 2020, pp. 41-42](#)). Aligning SDGs and NEP can assist to promote innovation and entrepreneurship in education, encouraging learners to expand skills that are relevant to the changing needs of the world and it can help to promote gender equality and social inclusion in education, recognizing the variety of learners needs ([Radha & Arumugam, 2023](#)).

- Focus on Teacher Training and Professional Development

NEP 2020 believed that teacher education is vital in creating a pool of schoolteachers that will shape the next generation. The policy suggests 4-year integrated B.Ed.; a minimal degree qualification for school teachers by 2030 ([NEP 2020, pp. 43](#)). Teachers should be trained to use innovative and inclusive teaching methods that uphold the values of the SDGs, such as collaboration, empathy, and environmental sustainability. This will help in building a skilled and motivated teacher workforce that can effectively employ the NEP 2020 and support the SDGs in their classrooms ([Radha & Arumugam, 2023](#)). NEP 2020 will create a comprehensive "National Curriculum Framework for Teacher Education" (NCFTE) 2021 formulated by the NCTE in discussion with NCERT ([NEP 2020, pp. 43-44](#)). NEP 2020 has provisions for comprehensive teacher training, continuous professional development, and performance-based assessments system which truly align with SDG Target 4.c, which

emphasizes the substantial increase in qualified teachers through international cooperation([Gupta & Meena, 2024](#)).

Enhancing Research and Innovation

By development a culture of research and innovation, NEP 2020 not only contributes to SDG 9 (industry, innovation, and infrastructure) but also enhances the quality and significance of education, ensuring that it serves as a driving force for sustainable development ([Gupta & Meena, 2024](#)). This Policy envisions a comprehensive approach to transforming the excellence and quantity of research in India this policy envisions the founding of a National Research Foundation (NRF) ([NEP 2020, pp. 45-46](#)).

- *Promoting Adult Education, Lifelong Learning and Global Citizenship*

NEP 2020 suggests a suitable infrastructure which will be ensure for interested adult's access to lifelong learning. NEP 2020 target's to achieve 100% Adult literacy by 2030 ([NEP 2020, pp. 51-52](#)).

NEP 2020's importance on inclusivity, equity, quality education, and lifelong learning resonates with the global pursuit of sustainable development. The policy's provisions, such as curriculum reforms, teacher training, and focus on marginalized groups, contribute substantively to SDG 4's vision of ensuring universal and quality education. By promoting a culture of dynamic policy evolution based on evidence and feedback, India can graph a path toward an equitable and sustainable future for its citizens ([Shukla et al., 2023](#)).

Aligning the Sustainable Development Goals (SDGs) and the National Education Policy 2020 (NEP 2020) can have numerous positive impacts on education and society as an entire and this can have a transformative impact on education and society, preparing learners to be accountable global citizens who can add to a better future for all ([Radha & Arumugam, 2023](#)).

Objective 2: To explores the role of educational technology in achieving SDG 4 as envisioned by NEP 2020.

The combination of technology in education is a common idea between NEP 2020 and the SDGs. NEP 2020's focus on leveraging technology to increase access to education, improve teaching-learning processes, and modernize educational planning and management corresponds with SDG Target 4.b ([Gupta & Meena, 2024](#)). The policy advocates the utilization of digital platforms, online resources, educational apps, and interactive multimedia tools to enhance teaching effectiveness, promote active learning, and personalize instruction ([Rana, 2024](#)). The Digital India Campaign is going to transform the complete nation into a digitally empowered society and knowledge economy. In that case, education will play a critical role in this transformation, technology itself will play an essential role in the enhancement of educational processes and outcomes; thus, the relationship among technology and education at all levels is bidirectional ([Ram, 2021](#)).

According to [NEP 2020](#) (paragraph, 23.3), An autonomous body, National Educational Technology Forum (NETF), will be formed to provide a stage for the free exchange of ideas

on the use of technology to improve learning, assessment, planning, administration, and so on, both for school and higher education. The aim of the NETF will be to assist decision making on the induction, deployment, and use of technology, by providing to the leadership of education institutions, State and Central governments, and other stakeholders, the latest knowledge and research as well as the opportunity to consult and share best practices.

The NETF will have the following functions:

- Offer independent evidence-based guidance to Central and State Government agencies on technology-based interventions.
- Construct intellectual and institutional capacities in educational technology.
- Visualize strategic thrust areas in this area.
- Coherent new guidelines for research and innovation.

Achieving SDG 4 target with the help of technology, [NEP 2020](#) (paragraph; 23.6) suggested that a rich diversity of educational software, for all the above purposes, will be developed and made accessible for the students and teachers at all levels. All such software will be accessible in all major Indian languages and will be reachable to a wide range of users plus students in remote areas and Divyang students. Technology-based education platforms, such as DIKSHA/SWAYAM, will be better incorporated across school and higher education and will include ratings/reviews by users, to enable content developers create accessible and qualitative content.

The National Research Foundation will expand research efforts in the technology. In the context of Artificial Intelligent (AI), NRF may think a three-pronged approach: (a) advancing core AI research, (b) increasing application-based research, and (c) advancing international research efforts to address international challenges in areas such as healthcare, agriculture, and climate change using AI ([NEP 2020, pp. 57](#)). James, P. & Pandey, P., (2024) in their study emphasized the use of AI-driven tools that individualize learning based on individual needs, pace, and progress and also utilize gamified platforms to increase engagement and inspiration in students. Every university may also expand courses in Machine Learning and specialized areas like health care, agriculture, and law areas via platforms, such as SWAYAM. For fast adoption, HEIs may mix together these online courses with traditional teaching in undergraduate and vocational programmes. Efforts to teach languages to school students will be dovetailed with efforts to improve Natural Language Processing for India's different languages ([NEP 2020, pp. 58](#)).

The [NEP 2020](#) (paragraph, 24.4) recommends some key initiatives of technology for the teaching-learning process at all levels from school to higher education which are bring up below:

- *Pilot studies for online education:* Appropriate agencies, such as the NETF, CIET, NIOS, IGNOU, IITs, NITs, etc. will be conduct a series of pilot studies, in parallel, to evaluate the reimbursement of integrating education with online education while explanatory the downsides and also to study related areas, such as student device

addiction, most preferred formats of e-content, etc. The results of these pilot studies will be publicly communicated and used for continuous improvement.

- *Digital Infrastructure:* There is a need to invest in the creation of open, interoperable, evolvable, public digital infrastructure in the education sector that can be used by multiple platforms and point solutions, to solve India's scale, diversity, complexity and device penetration. This will ensure that the technology-based solutions do not become outdated with the rapid advances in technology.
- *Online teaching platform and tools:* Appropriate existing e-learning platforms such as SWAYAM and DIKSHA, will be extended to provide teachers with a structured, user-friendly, rich set of assistive tools for monitoring the progress of learners. Apparatus, such as two-way-video and two-way-audio interfaces for holding online classes are a real requirement as the earlier period epidemic had shown.
- *Content creation and Digital storehouse:* A digital storehouse of content including the creation of coursework, learning games & simulations, virtual reality will be developed, with a clear public system for ratings by users on effectiveness and quality. For fun-based learning student-appropriate tools like apps and gamification of Indian art and culture, in multiple languages, with clear working instructions, will also be formed.
- *Addressing the digital divide:* In the current scenario a large section of the population whose digital access is highly limited, the accessible mass media, such as television, radio, and community radio will be widely used for telecast and broadcasts. Such educational programmes will be made available 24/7 in different languages based on the student population. A particular focus on content in all Indian languages will be emphasized and mandatory; digital content will need to accomplish the teachers and students in their medium of instruction as much as possible.
- *Virtual Labs:* Presented e-learning platforms such as DIKSHA, SWAYAM and SWAYAMPBHA will also be leveraged for creating virtual labs so that all students have the same access to quality practical and experiment-based learning experiences. The possibility of providing sufficient access to SEDG students and teachers through appropriate digital devices.
- *Training and incentives for teachers:* Teachers will undergo rigorous training in learner-centric pedagogy and on how to become high-quality online content creators themselves using online teaching platforms and tools. There will be emphasis on the teacher's role in facilitating active student engagement with the content and with each other.
- *Online assessment and examinations:* Suitable bodies, such as the proposed National Assessment Centre or PARAKH, School Boards, NTA, and other identified bodies will design and execute assessment frameworks encompassing design of competencies, portfolio, rubrics, standardized assessments, and assessment analytics.

Studies will be undertaken to pilot new ways of assessment using education technologies focusing on 21-st century skills.

- *Blended models of learning:* While promoting digital education, the significance of face-to-face teaching-learning is fully documented. Accordingly, diverse effective models of blended learning will be recognized for suitable replication for different subjects.
- *Laying down standards:* As research on online/digital education emerges, NETF and other appropriate bodies shall set up standards of content, technology, and pedagogy for online/digital teaching-learning. These standards will help to formulate guidelines for e-learning by States, Boards, schools, HEIs, etc.

Also, NEP 2020 highlights the combination of traditional and technology driven hybrid learning model in the classroom. For that, encourage the use of Flipped classroom where student's access lectures through online and actively engage during class time. It also encourages the use of Massive Open Online Courses (MOOCs) for higher education and lifelong learning. Therefore, NEP 2020 recommended regular training programs to equip educators with the skills needed to use technology effectively in classrooms and also develop online communities of practice for teachers to share best practices and resources ([James & Pandey, 2024](#)).

4. Discussion

National Education Policy (NEP) 2020 of India represents a transformative step towards redefining and stimulating the educational landscape, with its plan deeply resonating with the Sustainable Development Goals (SDGs) set by the United Nations ([Gupta & Meena, 2024](#)). NEP 2020 and the SDGs share familiar objectives related to promoting access to quality education, improving learning outcomes, and encouragement innovation and research ([Radha & Arumugam, 2023](#)). NEP 2020 advocates for the establishment of schools in remote areas and the provision of scholarships to disadvantaged students, aligning with SDG 4's emphasis on equal access. NEP 2020 recognizes inclusive education for children with disabilities and special needs. This aligns with SDG 4's target of providing inclusive education for all learners. NEP 2020's focus on enhancing the quality of education through curriculum reforms, teacher training, and pedagogical innovations aligns with SDG 4's goal of ensuring quality education. The policy's integration of vocational education and practical skills training resonates with SDG 4's aim of equipping learners with relevant skills for employment and sustainable livelihoods. NEP 2020's emphasis on holistic development, including physical, mental, and emotional well-being, aligns with SDG 4's idea of nurturing well-rounded individuals ([Shukla et al., 2023](#)).

NEP 2020 going to create a milestone in Indian education system for that integration of technology plays a significant role. NEP 2020 suggests to form an Academic Bank of Credit (ABC) shall be established which would digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded taking into account

credits earned. An autonomous body, the National Educational Technology Forum (NETF), will be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration, and so on, both for school and higher education. NEP [2020](#) (paragraph; 23.6) suggested that a rich variety of educational software, for all the above purposes, will be developed and made available for the students and teachers at all levels. Technology-based education platforms, such as DIKSHA/SWAYAM, will be better integrated across school and higher education and will include ratings/reviews by users, to enable content developers create user-friendly and qualitative content. Every university may also develop and disseminate courses in Machine Learning and professional areas like health care, agriculture, and law areas via platforms, such as SWAYAM. The National Research Foundation will initiate or expand research efforts in the technology. A digital repository of content including the creation of coursework, learning Games & Simulations, Augmented Reality and Virtual Reality will be developed, with a clear public system for ratings by users on effectiveness and quality. Teachers will undergo rigorous training in learner-centric pedagogy and on how to become high-quality online content creators themselves using online teaching platforms and tools. It also encourages the use of Massive Open Online Courses (MOOCs) for higher education and lifelong learning. So, in one sentence we can conclude that, NEP 2020 offers a significant opportunity for access to lifelong learning and quality, affordable education that has the power to reshape the Indian education sector. For the attainment and execution of SDGs societal, economic, and environmental these three criteria are very important and the basis of these criteria is education. Therefore, investigators believe that NEP 2020, going to make a milestone for the 21st Indian education system which also aligns with the global target.

4.1. Limitations and Future Research

The present study, discuss the areas of emphasis on SDG 4 as envisioned by NEP 2020 and also explores the role of educational technology in achieving SDG 4 as envisioned by NEP 2020. After discussion, investigators recognise that it has certain delimitations that need to be acknowledged which also provide a variety of opportunities for future research. The success of NEP 2020 depends on how it is going to be effectively implemented across different states in India. This study is based on NEP 2020 document analysis where we have to wait for genuine data to understand its actual effects. Also, investigators especially deal with one goal (SDG 4) out of the SDG 17 goals.

Investigators conclude that the prospect research should be on longitudinal studies addressing the actual data on the impact of NEP 2020 on SDG 4 indicators such as equity, accessibility, quality of education, integration of technology in education etc. Comparative studies can be conducted among different states as well as between special countries to see the accomplishment of similar reforms in different areas related to education, SDGs frameworks. Analyzing the role of stakeholders, public-private partnerships, technology initiatives, digital education initiatives, and teacher instruction programs in enhancing SDG 4 from the view point of attainment under NEP 2020 would also be a key area for future study.

5. Conclusion

In conclusion, the union of the Sustainable Development Goals (SDGs) and India's National Education Policy (NEP) 2020 represents a potential paradigm shift towards sustainability. NEP 2020 is one of India's ambitious policies, aligning with the global target of SDG 4, contributing to the wider vision of equitable education for all. Together, they create a powerful weapon, reflecting a global issue on the need for transformative education policies. SDG 4 provides a comprehensive roadmap, encouraging every country to formulate new policies along implements them. Therefore, India comes with a 21st-century National Education Policy (NEP 2020) that prioritizes quality education, foundational literacy, inclusivity, and the integration of technology at every level in the education system. By fostering a collaborative approach among countries to learn from each other successes strategies and challenges, SDG 4 and NEP 2020 foster significantly the global vision towards equality, quality, equity, and inclusivity in education. This collective step can build a brighter future through education by encouraging necessary 21st-century knowledge and skills to navigate the new world.

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