Academic Guru

NATIONAL EDUCATION POLICY 2020: THE KEY TO DEVELOPMENT IN INDIA

Volume 1
Year: 2024

AG PH Books

STEM Education: Present Status and Future Direction

Dr. Malcolm Homavazir[1], Dr. Zuleika Homavazi[2*]

[1]*Associate Professor, ATLAS SkillTech University*

[2]*Professor, ATLAS SkillTech University.*

Abstract

The most effective way to develop and utilise a nation's enormous resources and capabilities for benefit of individuals, society, nation, and the world is to provide universal, high-quality education. The Union Cabinet of India granted approval to the National Education Policy 2020 (NEP 2020), which establishes the objectives for India's forthcoming education system, on July 29, 2020. By substituting the National Policy on Education from 1986. NEP 2020's alignment with promoting STEM (science, technology, engineering & mathematics) education, systematic implementation are the subjects of this conceptual paper.

Keywords: STEM, NEP 2020, Education, Present scenario, Future Scenario.

1 Introduction

Constantly conforming to the shifting demands of society as well as technological and intellectual progress, the educational landscape is in a constant state of change. STEM (Science, Technology, Engineering, and Mathematics) education has become a crucial component in this paradigm shift in recent decades. STEM education gives individuals the essential competencies required to innovate and adapt in a technologically dynamic world. STEM education is vital for societal advancement, not just for the professional success of individuals. STEM education equips students to tackle intricate challenges

* ISBN No. - 978-81-973048-8-0

such as climate change, advancements in healthcare, and technological innovation through the cultivation of critical thinking, ingenuity, and problem-solving skills. (Marzuki et al., 2024)

Curriculum as well as educational policies that are in accordance with contemporary technological and societal demands are facilitated. In contrast, the study emphasises to students the fundamental competencies and understandings necessary to prosper in a contemporary, technology-driven society. Additionally, a workforce that's well-equipped to foster innovation and economic expansion benefits the greater community. The results of the study underscore the importance of implementing STEM education in tangible, real-life contexts. The article examines the ways in which different pedagogical approaches, such as inquiry-based learning and project-based learning, can substantially improve student engagement and academic achievements. Additionally, approaches to increasing the accessibility and inclusivity of STEM education are explored in the study, guaranteeing that students from various backgrounds can derive advantages from it.

Background of STEM

Progress in Education STEM education, which comprises Science, Technology, Engineering, and Mathematics, originated in the United States after Sputnik, when it became evident that enhanced scientific education was crucial for sustaining global competitiveness. Over the course of time, STEM education has progressed beyond being a simple fusion of four disciplines. This methodology embodies an interdisciplinary strategy that seeks to amalgamate these fields of study into a unified educational framework grounded in practical, real-life scenarios. This approach to education is based on the idea that these four fields are fundamental to a well-rounded education that includes the ability to think critically and solve problems.

The Evolution of STEM Education

The origins of STEM education can be identified in United States during the Cold War, specifically in the post–World War II era, when maintaining technological and scientific superiority became an increasing concern. The Soviet Union's 1957 Sputnik launch constituted a turning point that prompted an increased focus on science and technology schooling in the United States. During this era, substantial federal funding was allocated towards scientific education, emphasising the strategic significance attributed to STEM disciplines. A transition from the conventional approach of teaching mathematics, science, technology, and engineering as distinct disciplines into a more integrated framework occurred during the latter half of the 20th century. The impetus for this transition stemmed from the recognition that practical challenges transcend disciplines and necessitate a comprehensive comprehension of all four STEM elements. In the early 2000s, the acronym "STEM" was introduced to represent this interdisciplinary approach to instructional and learning in these fields.

The Alliance of NEP 2020 and STEM

STEM Learning is an educational and developmental approach that incorporates the disciplines of science, technology, engineering, and mathematics. STEM education has developed over time into a

multidisciplinary philosophy that is essential for instilling in students cutting-edge abilities such as creativity, critical thinking, and problem-solving. Although its necessity and significance have been acknowledged for quite some time, ubiquitous technological progress has elevated it to the status of an indispensable prerequisite for contemporary educational systems.

The promotion of scientific literacy and the cultivation of a scientific inclination have been subjects of considerable discourse in India. However, within our educational framework, STEM education continues to be undervalued. Although numerous innovations have been rapidly implemented, such as smart classrooms, e-learning, and assessment tools, STEM education has failed to proliferate at the rate that it deserved. Insufficient provision of fundamental components such as curriculum, teaching and learning materials, specialised laboratory facilities, do-it-yourself kits, and so forth, continues to impede STEM education in schools. STEM education has historically been perceived as a diversion within a system which has predominantly relied on rote learning and examinations. This approach effectively prevented the development of a research culture and relegated learning to a secondary position. The much-anticipated Nation Education Policy 2020 (NEP) may ultimately serve as the catalyst necessary to enhance STEM education in India, despite the fact that this disparity has been acknowledged in general and some progress has been made in this regard over the past few years.

"While popularising science and fostering a scientific temperament have been subjects of considerable debate in India, STEM education continues to be undervalued within our educational system."

The Union Cabinet granted approval to the NEP on July 29th, 2020. NEP was anticipated to cover the numerous voids in our current educational system, and in the majority of respects, it has performed admirably. It serves as a foundational structure for numerous reforms aimed at filling in the deficiencies. One of the primary objectives of NEP is to replace the current method of rote learning in education with hands-on, evidence-based learning. NEP acknowledges and establishes a trajectory for an interdisciplinary educational approach that is in line with the tenets of STEM education. NEP advocates for increased experiment-based instruction and hands-on learning in institutions. It also acknowledges the importance of instilling scientific rigour, evidence-based learning, and coding abilities in students.

Coding instruction beginning in sixth grade is an extremely welcome development that will enhance STEM education. Incorporating Artificial Intelligence (AI) and block programming into school curricula will provide students with a firm foundation in essential skills necessary for vocations in the twenty-first century. STEM is being brought to life in school classrooms through numerous initiatives from the government and EdTech companies to establish STEM Labs utilising emerging technologies such as 3D printing, electronics, the Internet of Things, and sensors. Given the emphasis that several nations, including South Korea, Japan, and Germany, place on STEM education to advance their economies and societies, expediting the implementation of STEM education in India could prove to be an excellent initiative for students and societies alike. The NEP will establish the ideal framework to promote STEM education, which will be crucial to achieving the government's goal of Atma Nirbhar Bharat.

Dr. Malcolm Homavazir[1], Dr. Zuleika Homavazi[2]

1.1 Advantages of STEM Education in India

Critical Thinking and Creativity Development: STEM education fosters in students aptitudes for critical analysis, innovative thinking, and resolution of complex issues.

Hands-on Learning and Practical Application: A STEM education framework promotes experiential learning and teaches students through hands-on activities. This practical approach enhances the capacity for strategic reasoning and decision-making.

Multifaceted Skill Development: Science, technology, engineering, and mathematics (STEM) lessons impart several skills, such as reasoning, analysis, creativity, collaboration, invention, critical thinking, and problem solving.

Understanding Everyday Technology: STEM education equips students with practical knowledge of the technologies and devices they utilise on a daily basis by facilitating their comprehension of their operation.

Encourage Experimentation: STEM education is predicated on experimentation, which permits pupils to investigate alternative resolutions to challenges and obstacles.

1.2 STEM Education: Present Scenario (NEP 2020)

Officially unveiled by the Indian government, the National Education Policy (NEP) 2020 signifies a substantial paradigm shift within the educational sphere of the nation. NEP 2020 seeks to revolutionise the current system by placing greater emphasis on the value of interdisciplinary and holistic education. Education in the STEM (Science, Technology, Engineering, and Mathematics) fields is a pivotal subject of emphasis in this policy, indicative of the increasing acknowledgement of its capacity to stimulate economic expansion and innovation.

Holistic and Multidisciplinary Approach: By integrating STEM disciplines with the humanities, arts, and social sciences, NEP 2020 promotes a comprehensive, multidisciplinary education system. Critical thinking, originality, and problem-solving abilities are intended to be fostered through this method.

Early Introduction and Integration

- **Foundational Stage:** NEP 2020 supports the inclusion of STEM principles in the early childhood curriculum (ages 3 to 8). Activity-based and play-based learning approaches are suggested for engaging young students with fundamental scientific and mathematical concepts.
- **Middle Stage:** Students in middle stage (ages 11-14) are strongly encouraged to participate in practical initiatives and experiential learning. Experimentation and practical application are utilised to establish a solid foundation within STEM subjects during this phase.

Flexibility in Curriculum and Choice of Subjects: The flexible curriculum structure of NEP 2020 permits students to select courses in accordance with their individual inclinations. In an effort to promote interdisciplinary study and lessen the rigorous demarcation between academic disciplines, this flexibility is intended to be implemented.

Emphasis on Coding and Computational Thinking: Computational thinking and coding are introduced during the middle school years (6th through 8th grades). The purpose of this early exposure programme is to provide students with fundamental abilities that are crucial in the digital age, including problem-solving and logical reasoning.

Focus on Experiential Learning and Inquiry-Based Approach: Experiential instruction and an inquiry-based method for teaching STEM subjects are encouraged by the policy. This entails the implementation of problem-solving exercises and real-world applications in order to augment students' comprehension and involvement.

Integration of Technology in Education: The significance of incorporating technology into education is emphasised by NEP 2020. It is recommended that educators make use of virtual laboratories, digital tools, and online resources in order to offer students personalised and interactive learning experiences.

Teacher Training and Professional Development: The policy acknowledges the imperative of instructors engaging in ongoing professional development. The proposition is to develop specialised training programmes in STEM education that would furnish educators with contemporary pedagogical approaches and technological expertise.

Assessment Reforms: NEP 2020 promotes the transition from memorization-based learning and conventional examinations to competency-based evaluation. This encompasses formative evaluations that centre on the comprehension and implementation of STEM principles by the students.

1.3 STEM Education: Future Scenario

In order to equip students for the complexities of the twenty-first century, the National Education Policy (NEP) 2020 of India prioritises STEM (Science, Technology, Engineering, and Mathematics) education and proposes an educational paradigm shift. In accordance with NEP 2020, the future of STEM education will be marked by technological integration, interdisciplinary learning, innovative pedagogical approaches, and an equitable and inclusive school system.

1. **Early Exposure and Foundation Building**

Activity-Based Learning: Students will initiate STEM education by participating in play-based as well as activity-based learning during foundational stage (ages 3 to 8). This methodology is intentionally crafted to incite inquisitiveness and enthusiasm for scientific principles via investigation and experiential learning.

Coding and Computational Thinking: Students will be prepared for a future dominated by technology by becoming proficient in coding and computational reasoning beginning in middle school (grades 6-8). Exposure to these skills at an early age will augment one's capacity for logical reasoning and problem-solving.

2. **Technology Integration**

Digital Classrooms: In the forthcoming era of STEM education, digital classrooms outfitted with smart boards, tablets, as well as internet connectivity are anticipated to be extensively implemented. These classrooms will foster learning experiences that are both interactive and captivating.

Virtual Labs and Simulations: Students will be able to conduct simulations and experiments in virtual laboratories, gaining practical experience without being constrained by the resources of physical laboratories. This will facilitate a more profound comprehension of engineering practices and scientific principles.

Artificial Intelligence (AI) in Education: Platforms powered by AI will provide individualised learning experiences by adjusting to the specific requirements of each pupil and delivering immediate feedback. Smart tutoring systems are expected to aid students in comprehending intricate STEM disciplines.

3. **Interdisciplinary and Experiential Learning**

Project-Based Learning (PBL): Project-based learning, in which students solve real-world problems requiring the implementation of multiple STEM disciplines, is encouraged by NEP 2020. This methodology promotes teamwork, innovation, and analytical reasoning.

STEAM Education: The integration of the arts through STEM (STEAM) disciplines will foster innovation and originality. The incorporation of artistic viewpoints into technological and scientific instruction will foster the development of comprehensive problem-solving strategies.

4. **Inclusive and Equitable Education**

Access to Resources: Every pupil, irrespective of socioeconomic status, will be provided with equitable access to high-quality STEM education. This entails furnishing adequately outfitted science laboratories, digital devices, and internet connectivity to underserved regions.

Diversity in STEM: The participation of the underrepresented groups, such as females and pupils from marginalised communities, in STEM fields will be the primary objective of initiatives. Scholarships and programmes will be established in an effort to further their academic and professional ambitions.

5. **Teacher Training and Professional Development**

Continuous Professional Development: Educators will participate in periodic professional development sessions to ensure they are well-versed in the most recent STEM education methodologies as well as technologies. Programmes for professional development will furnish educators with the necessary competencies to instruct and motivate students in STEM disciplines.

Mentorship and Collaboration: Educators will receive mentorship from seasoned industry professionals and experts, who will offer guidance and exchange best practices. The exchange of resources and concepts among educators will be facilitated by collaborative networks.

6. **Assessment and Evaluation Reforms**

Competency-Based Assessment: Subsequent assessments will shift their emphasis from mere memorization to the evaluation of students' comprehension and implementation of STEM principles. Competency-based evaluations will assess problem-solving and practical aptitudes.

Portfolio-Based Assessment: Students shall assemble portfolios that will effectively demonstrate their research, experiments, and projects. This all-encompassing evaluation approach will furnish a holistic perspective of their educational progression and accomplishments.

7. **Global Collaboration and Partnerships**

International Collaborations: By forming alliances with international educational organisations and institutions, STEM education will be of a higher calibre. International competitions, collaborative research initiatives, and exchange programmes will all afford students a wide range of educational experiences.

Industry-Academia Collaboration: The integration of industry and academic collaboration will serve to connect theoretical concepts with their practical implementation. Through internships, industry initiatives, and guest lectures, students will gain practical experience in STEM fields.

2 Literature Review

(Wadwale, 2020) After 34 years, the National Education Policy was established following more than four years of nationwide deliberations led by preeminent academicians from our universities. The document's profound recommendations—including the establishment of research universities, the use of technology to improve access to quality education, and a single regulator for "light but tight" regulation of higher education—have earned it the reputation of a policy document with limitless transformative potential. In order to foster innovation, entrepreneurship, and the establishment of sizable multidisciplinary institutions. Presently, it is widely acknowledged that education serves as a self-sustaining resource and a means to address emerging requirements. Moreover, innovation results from both necessity and adversity. The NEP–2020 places confidence in the academic and research community's capacity to make significant contributions to the global body of knowledge, garner international recognition, and position India at the forefront of academic nations.

(Singh, 2020) India's education sector has undergone a paradigm shift with the New Education Policy 2020, which seeks to revolutionise the nation's approach to development and learning. The present research paper investigates the ramifications and difficulties that arise from the execution of NEP 2020. The research investigates the potential consequences of the policy's comprehensive methodology, incorporation of technology, multilingualism, curriculum flexibility, assessment modifications, and teacher preparation. Moreover, it explores the obstacles encountered during the implementation of the policy, including the allocation of resources, opposition to change, preservation of academic standards, scarcity of teachers, bridging digital divide, and guaranteeing inclusiveness for a wide range of students.

(Aithal & Aithal, 2020) A nation must have a well-defined and forward-thinking education policy at the secondary and tertiary levels, as education is the engine of economic and social development. In order to optimise effectiveness, various nations implement distinct education systems that take into account their respective cultures and traditions, as well as distinct phases of development at the secondary and tertiary levels. The Education Policy recently unveiled by the Government of India is a product of the recommendations put forth by an expert committee presided over by Dr. Kasturirangan, a former chairman of Indian Space Research Organisation (ISRO). This paper examines and contrasts a number of higher education system-announced policies with the system that is presently in effect.

(Banerjee et al., 2021) It is critical that all levels of educational institutions implement an innovative and well-defined education policy that contributes to social and economic progress. In accordance with their cultural heritage and customs, numerous nations have developed diverse education systems and life stages to ensure academic success at the collegiate level. A few months ago, the Indian government issued a new education policy under the direction of a committee led by Dr. K. Kasturirangan. Additionally, he led the Indian Space Research Organisation (ISRO) as its former chairman. The committee was established in June 2017, and its report was submitted on May 31, 2019. The primary focal points of this paper encompass a range of educational stage characteristics, key principles underlying the new policy, distinctions between the previous National Education Policy of 1986 and the present National Education Policy of 2020, various implementations within the higher education system, innovations incorporated in NEP 2020, principal ramifications of NEP 2020, benefits of higher education as outlined in NEP 2020, and recommendations for enhancements.

(Sahoo, 2021) In the twenty-first century, the world is expanding at an accelerated rate due to the rapid advancement of science and technology. It has significantly altered the way in which people live and social processes operate. Living in a changing scenario has presented an increased number of challenges. Difficult and intimidating is the task of equipping students to navigate and thrive in the twenty-first century. Students must acquire a variety of skills and knowledge and adopt an interdisciplinary perspective on the world in order to remain current. This study utilises and evaluates policies, in particular the National Curriculum Framework 2005 (NCF 2005) as well as National Education Policy (NEP 2020), to investigate the contribution of Science Education to the development of 21st Century Learning Skills. These skills have been suggested as a means to equip students with the necessary abilities to navigate the complex challenges of the twenty-first century.

(Naveen, 2021) The NEP, 2020 establishes a structural blueprint for the comprehensive overhaul of Technical Education (TE) to align with the demands of an Indian society that is knowledge-driven and undergoing rapid transformation. This article offers a thorough examination of the NEP's equitable and logical framework of viewpoints, in addition to other pertinent details regarding the mechanisms underlying qualitative transformations in TE. NEP, 2020 objectives include expanding the scope of technical education (TE) to include degree and diploma programmes, fostering closer collaborations between industry and higher education institutions (HEIs) to promote innovation and research, leveraging technology to bridge the gap between technical education and other disciplines, strategizing

to incorporate technical education into multidisciplinary education institutions as well as programmes, and equipping professionals with expertise in critical areas.

(Irwanto et al., 2022) STEM education is currently a critical factor in determining the competitiveness and economic development of nations. The objective of this systematic review was to identify ten-year research trends within STEM education. The analysis incorporated a compilation of 336 studies that had been published in reputable scientific journals, including Science Education, Research in Science Education, Journal of Science Education, International Journal of Science Education, and Science Education. The temporal scope was confined to the years 2011 through the latter part of 2020. Then, in order to ascertain the most recent research trends and the current state of STEM education, an examination was conducted on all sample papers. This examination encompassed various metrics such as the number of papers published annually, the categories of research conducted, the ranking of countries, and number of authors. In order to gather data, the formula suggested by Howard et al.

(Venkat Iyer Associate Professor & Kalyandurgmath, 2022) Education is fundamental to achieving one's utmost capabilities, fostering an equitable and just society, and propelling the advancement of the nation. Every nation must have a clearly defined, forward-thinking, and futuristic education policy, given that education is the primary catalyst for both economic and social development. Education policies vary across countries in accordance with their respective traditions and cultures. The most effective way to develop and utilise a nation's enormous resources and capabilities for the good of individuals, society, nation, and the world is to provide universal, high-quality education. The Union Cabinet of India granted approval to the National Education Policy 2020, which establishes the objectives for India's forthcoming education system, on July 29, 2020. By substituting the National Policy on Education from 1986. NEP 2020 aims to establish an all-encompassing structure encompassing primary education, higher education, vocational training, and more.

(Sharma, 2023) Education and the economy are the two 'E's' that are essential to the growth and development of any nation. The economic development of a state is significantly influenced by education (Idris et al., 2012). Following China, India has third-largest tertiary education system in the globe. Primary education is the foundation of the Indian educational system, which is succeeded by secondary education at the school level and higher education comprising four years of doctoral studies, three years of postgraduate study, and two years of graduation. Universities that provide degrees include those that are central, state, deemed, institutes of national significance, private, associated with the University, or otherwise recognised as having a strong academic reputation. Education is fundamental to discovering and honing human potential for the holistic development of both the individual and the nation. Education policies are periodically formulated in order to guide the education system in accordance with present and future needs.

(Soni, 2023) The National Education Policy 2020, or NEP 2020, is a policy document that was officially declared by Government of India in July 2020. Through an emphasis on holistic as well as multidisciplinary education, the promotion of research and innovation, and the integration of technology into the learning process, the NEP 2020 intends to revolutionise the Indian education system. The NEP

2020 acknowledges the pivotal significance of libraries in fostering a culture of continuous learning and reading. The strategy highlights the importance of public and school libraries by ensuring they have sufficient funding, staff, and materials to support their mission.

(Das et al., 2023) The inaugural education policy of twenty-first century, the New Education Policy 2020, was unveiled on July 29, 2020. In a developing country such as India, higher education is vital because it fosters human development. Since its independence, India's higher education system has expanded astronomically. It will facilitate the development of the nation through the distribution of specialised knowledge and skills. The objective of this research is to examine the effects of NEP 2020 on higher education system. Furthermore, it underscores the challenges and obstacles that the present higher education system in India confronts. The data utilised in this research were descriptive secondary sources that were analysed in accordance with the study's objectives.

(Das & Das, 2024) The integration of contemporary discoveries or technologies into the curriculum does not constitute innovation. On the contrary, its design ought to cultivate ingenuity, analytical reasoning, and the resolution of challenges. Additionally, it ought to encompass exercises that foster collaboration and communication among instructors and learners. By making a minor deviation from the conventional instructional approach, the individual enhances the efficacy of conveying the significance of the concept (Sarta, 2022). Students' curiosity is stimulated by creative education, which may be more conducive to conceptualization (Singh, 2021).

(Marzuki et al., 2024) This extensive article explores the dynamic domain of STEM education, which is an essential element in the contemporary educational environment. The review emphasises the transformation of STEM education from a simple amalgamation of four disciplines to a comprehensive, interdisciplinary strategy that is vital for fostering the growth of problem-solving and critical thinking abilities. A technology-driven global economy and the need for innovative and analytical abilities necessitate STEM education in order to adequately equip students for complexities of the twenty-first century. Aspects of STEM education that are examined in the review include issues of access and equity, the requirement for specialised educator training, and student engagement. This article examines the effects of STEM on students' academic achievement, skill growth, and readiness for the profession, drawing attention to the ways in which STEM education improves both personal and social opportunities for employment.

(Ghatak, 2024) Article 21 of the Indian Constitution guarantees the inalienable right of every individual to live via dignity and without prejudice. A quality education ensures that every person has the opportunity to lead a dignified existence and contributes to the pursuit of social justice. The National Education Policy, 2020 recognises the principle of "putting the last first" and deliberates on various approaches to ensure that all individuals have access to a high-quality education. Examining the perceptual lucidity of school instructors regarding the implementation of the National Education Policy (NEP), 2020 within educational institutions was the objective of this research. The study investigated how the socioeconomic status and level of knowledge regarding NEP, 2020 of educators affect their perspectives. Information was gathered utilising a variety of qualitative and quantitative data in

accordance with a descriptive research design. In order to deliberately select willing participants for the research, Purposive Sampling was employed from two distinct minority institutions situated in Ranchi, Jharkhand.

3 Conclusion

This paper focuses primarily on STEM and its relationship with NEP 2020, as well as the current and future scenarios surrounding it. Conversely, NEP 2020 endeavours to establish a resilient STEM education infrastructure. Furthermore than furnishing students with fundamental knowledge and abilities, this system will motivate them to emerge as trailblazers and authorities in their specific domains.

References

[1]. Aithal, P. S., & Aithal, S. (2020). Analysis of the Indian National Education Policy 2020 towards Achieving its Objectives. *International Journal of Management, Technology, and Social Sciences*, *102549*, 19–41. https://doi.org/10.47992/ijmts.2581.6012.0102

[2]. Banerjee, N., Das, A., & Ghosh, S. (2021). National Education Policy (2020): a Critical Analysis. *Towards Excellence*, *13*(3), 406–420. https://doi.org/10.37867/te130334

[3]. Das, P., & Das, G. (2024). National Education Policy-2020: Research and Innovations for Transforming Higher Education. *University News*, *62*(11), 20–27. https://doi.org/10.5281/zenodo.10845051

[4]. Das, P., Das, G., & Barman, P. (2023). National Education Policy 2020: Current Issues and Reimagining the Future of Higher Education. *The International Journal of Indian Psychology*, *11*(3), 3880–3889. https://doi.org/10.25215/1103.360

[5]. Ghatak, D. I. (2024). Perceptual Clarity of School Teachers About National Education Policy , 2020. *Educational Administration: Theory and Practice*, *30*(5), 7588–7594. https://doi.org/10.53555/kuey.v30i5.4213

[6]. Irwanto, I., Saputro, A. D., Widiyanti, Ramadhan, M. F., & Lukman, I. R. (2022). Research Trends in STEM Education from 2011 to 2020: A Systematic Review of Publications in Selected Journals. *International Journal of Interactive Mobile Technologies*, *16*(5), 19–32. https://doi.org/10.3991/ijim.v16i05.27003

[7]. Marzuki, O. F., Lih, E. T. Y., Zainol @ Abdullah, W. N. Z., Khairuddin, N., Inai, N. H., Md Saad, J. B., & Abdul Aziz, M. H. (2024). Innovating Education: A Comprehensive Review of STEM Education Approaches. *International Journal of Academic Research in Progressive Education and Development*, *13*(1), 614–631. https://doi.org/10.6007/ijarped/v13-i1/20490

[8]. Naveen, H. M. (2021). NEP, 2020: Perspectives and Future of Technical Education in India. *International Journal of Creative Research Thoughts*, *9*(9), 468–471. www.ijcrt.org

[9]. Sahoo, P. R. (2021). Reimagining the Role of Science Education in Development of 21st Century Learning Skills with Reference to NEP 2020. *Educational Quest- An International Journal of*

Education and Applied Social Sciences, *12*(2), 161–168. https://doi.org/10.30954/2230-7311.2.2021.14

[10]. Sharma, L. (2023). New Education Policy-Lab To Land Vision For Science And Technology. *International Journal of Creative Research Thoughts*, *11*(9), 543–551.

[11]. Singh, S. (2020). New Education Policy (NEP) 2020 : Issues , Implications and Challenges in. *International Journal of Scientific Research in Science and Technology*, 612–619.

[12]. Soni, M. (2023). A Literature Survey on National Education Policy 2020 (NEP 2020) and Libraries. *Journal of Learning and Educational Policy*, *34*, 13–26. https://doi.org/10.55529/jlep.34.13.26

[13]. Venkat Iyer Associate Professor, G., & Kalyandurgmath, K. (2022). New Education Policy NEP2020:Importance of Technology Use, Integration and STEM Education. *JETIR2201146 Journal of Emerging Technologies and Innovative Research*, *9*(1), 338–347. www.jetir.orgb338

[14]. Wadwale, P. A. P. (2020). NEP and Innovations in Indian Higher Education. *National Multidisciplinary Conference on Emerging Trends*, 204–209.