21st-Century Learning Skills and NEP 2020

Vaishali Anand

Ph.D. scholar, School of Education, IGNOU, Delhi

Abstract

The Government of India launched NEP 2020 as a comprehensive reform that focuses on revamping the Indian education system with a highlighting focus on the development of 21st-century skills. 4C's refers to the learning skills i.e., creativity, critical thinking, collaboration, and communication as referred to by the Handbook of 21st-century Skills by CBSE. These skills and competencies are essential to prepare learners for the modern world which is technologically advanced and needs innovative problem-solving skills. There is a strong shift in focus from content-centric to a competency-based approach in NEP 2020. Critical thinking encourages learners to engage deeply with the subject matter, rather than focusing on rote memorization. As per this policy, learners are encouraged to be involved in deep engagement, critical reflection, inquiry-based learning, and questioning, so that they can be nourished into independent, critical thinkers who are capable of making informed decisions in the evolving world (NCFSE, 2023). Creativity encourages learners to be involved in project-based assignments and hands-on activities. This encourages learners to think out of the box and apply their diverse solutions to real-world problems. Communication emphasizes the development of communication skills, both verbal and non-verbal.

Furthermore, NEP 2020 emphasizes fostering individual competencies along with the role of educators in effectively implementing the 4C's of learning skills. Professional training for teachers on collaborative teaching methods, inquiry-based pedagogy, and project-based learning are proposed in this policy. NEP 2020 observes a shift in teacher-student relationships fostering collaboration and dynamic interaction. Also, integrating technology into the teaching-learning process is emphasized in this policy.

NEP 2020 reflects a strategic shift towards a more holistic, skill-based education system by integrating the 4C's of Learning skills. This study with a Systematic Literature Review as research methodology seeks to explore in-depth NEP 2020 and the role of 4C's in shaping 21st-century learning, thus transforming the Indian education system. Elaborated discussion about these skills, classroom activities fostering these skills and competencies achieved by integration of these skills are discussed in this study.

Keywords: NEP 2020, 4C's, Learning Skills, CBSE, Critical Thinking, Creativity, Communication, Collaboration, NCFSE 2023.

1. Introduction

In today's fast-changing world, skills like critical thinking, communication, collaboration, and creativity—commonly known as the 4C's—have become essential for success. These aren't just buzzwords; they represent the abilities every individual needs to navigate the challenges of a globalized society, adapt to technological advancements, and solve complex problems. For years, education in India leaned heavily on rote learning and memorization. However, with the National Education Policy (NEP) 2020, this approach is undergoing a remarkable transformation.

NEP 2020 envisions an education system that prepares students not just to pass exams, but to thrive in life. By embedding the 4C's into its core, the policy shifts the focus to holistic learning and real-world skills. It aims to foster innovative, adaptable, and confident individuals who can communicate effectively, think critically, and work collaboratively—qualities that are vital in today's interconnected world. This paper delves into how NEP 2020 is reshaping Indian education by integrating the 4Cs into teaching and learning practices. It explores how this human-centred approach is empowering students, nurturing their creativity, and preparing them for a future full of opportunities and possibilities.
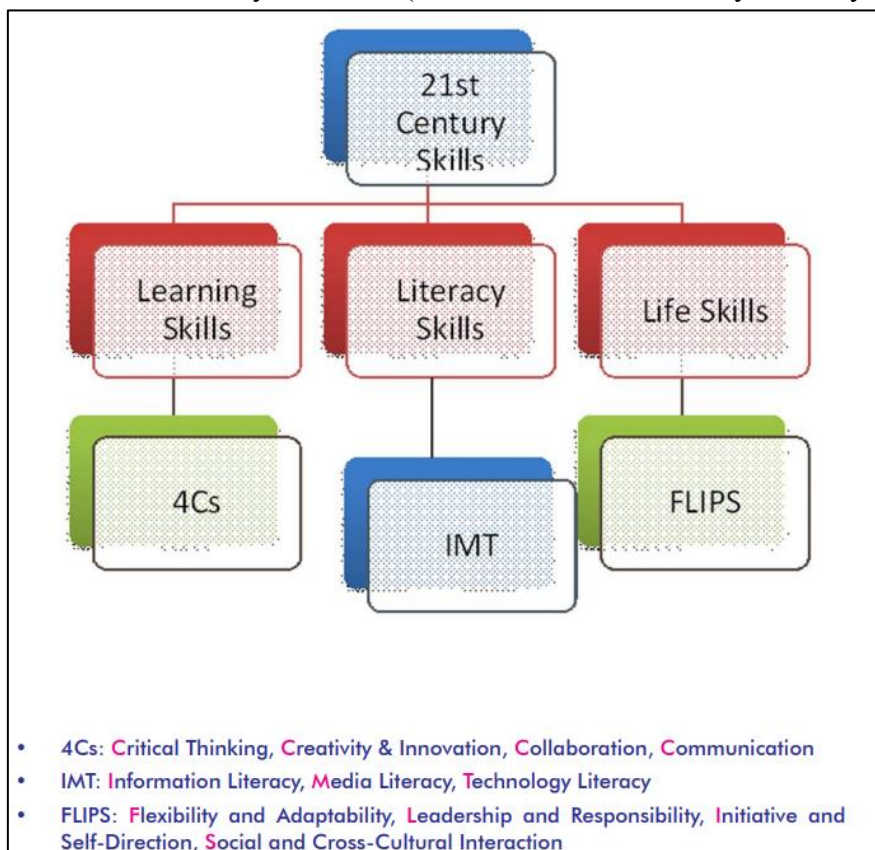
2. Theoretical Framework-
2.1 Future of Learning in the 21st century by UNESCO-
The document titled "Education for Sustainable Development Goals: Learning Objectives" by UNESCO outlines key learning objectives to help achieve the Sustainable Development Goals (SDGs) through education. It offers detailed frameworks for integrating sustainability into curricula across cognitive, socio-emotional, and behavioral dimensions. Designed for policymakers, educators, and curriculum developers, the report provides tools and guidance to enhance learners' capacity to address sustainability challenges effectively. The 4Cs in the context of UNESCO's Education for Sustainable Development Goals framework typically refer to Critical thinking, Collaboration, Communication, and Creativity. These 4Cs are the base of teaching-learning process in NEP 2020.

2.2 NEP 2020: 4C's of Learning Skills and Classroom Strategies for their development-
"The term 21st-century skills refers to a broad set of knowledge, skills, work habits, and character traits that are believed— by educators, school reformers, college professors, employers, and others—to be critically important to success in today's world." (Handbook of 21st-century skills by CBSE)

- 4Cs: Critical Thinking, Creativity & Innovation, Collaboration, Communication
- IMT: Information Literacy, Media Literacy, Technology Literacy
- FLIPS: Flexibility and Adaptability, Leadership and Responsibility, Initiative and Self-Direction, Social and Cross-Cultural Interaction

Figure 1 Handbook of 21st-century skills, CBSE, 2020

- **Critical Thinking**

Critical thinking refers to "a conscious and deliberate process which is used to interpret or evaluate information and experiences with a set of reflective attitudes and abilities that guide thoughtful beliefs and actions." (Mertes, 1991)

As per Edward Glaser, Critical thinking involves examining beliefs and knowledge in the light of evidence, recognizing problems, and finding solutions.

John Dewey introduced the concept of "critical thinking" in 1910, linking it to the scientific attitude of mind. However, he more commonly referred to this educational goal as "reflective thought" or simply "thinking." Critical thinking, as understood today, involves the ability to analyze, evaluate, and synthesize information objectively, enabling individuals to make reasoned judgments. This skill is considered essential for effective problem-solving and decision-making, especially in today's complex and fast-paced world.

Within the framework of CBSE's 21st Century Skills Handbook, critical thinking is identified as a core competency that enables students to engage with problems in a questioning and analytical manner. It encourages learners to dive deeper into content, approach challenges creatively, and make informed decisions. CBSE's approach includes various curricular activities to develop this skill, such as problem-solving exercises, inquiry-based learning, and project-based assessments. These methods align closely with the principles of the National Education Policy (NEP) 2020, which advocates for an inquiry-driven, discovery-based, and discussion-focused approach to education. NEP 2020 seeks to move away from traditional rote learning and high-stakes exams, instead fostering environments where critical thinking can thrive through continuous, formative assessments.

Some activities suggested in the CBSE Handbook 2020 to develop critical thinking are as follows-

- Adla Badli (Impromptu Debate)- In this activity, topics are given to the learners and given autonomy to choose the side they wish to speak from, but on the day of the debate teacher will reverse the sides of the learners and give them sufficient time to prepare. This will allow the learner to think promptly and diversely from his/her preparation.

- Ask Yourself (Self-made questions)- In this activity, students prepare questions based on the text, other than the ones mentioned in the textbooks. This will help learners to think differently and innovatively.

- Gap Fill-In- In this activity, learners are given paper and a pen. Then they are shown a picture and they must write about what they could in that picture. Then at the bottom of the page, they have to write about what they believe is happening in the picture, like any action or situation. Then, in the leftover space, they must write the steps by which they could conclude their understanding.

- Pucho to Samjhe (Cross-Questioning)- In this activity, learners will pose questions in the classroom and their peers will cross-question them.

- Gol Mol (Asking Riddles)- In this activity, the teacher will ask riddles from the learners.

Creativity

"Creativity is the capacity to combine elements in a new way, the ability to make an unexpected connection." (Vygotsky, L. (2004). Imagination and Creativity in Childhood. MIT Press.) "Creativity is the production of novel and useful ideas by an individual or small group of individuals working together." (Amabile, T. M. (1996). Creativity in Context: Update to the Social Psychology of Creativity. Westview Press.)

CBSE has taken many initiatives to integrate creativity and innovation in the teaching-learning process. Art-Integrated Learning by CBSE is an initiative that focuses on creativity and innovation in the teaching-

learning process. This approach encourages learners to integrate artistic expression with core subjects like mathematics, science, and language arts. Also, Project-based learning is another example of creativity in the teaching-learning process. Learners are encouraged to take project-based and research-based tasks that require creative solutions. Encouraging innovations like The CBSE Science Exhibition and participation in programs like the National Innovation Foundation encourage learners to develop innovative ideas that address real-world challenges, promoting creativity in problem-solving. NEP 2020 promotes multidisciplinary learning that combines arts, sciences, and vocational subjects, providing a fertile ground for creativity. The policy highlights the importance of integrating creativity into all aspects of education, recognizing it as key to both academic and personal growth. The establishment of Atal Tinkering Labs (ATL) in schools encourages creativity and innovation in STEM fields, giving learners access to tools for designing and experimenting with technology and engineering solutions.

Classroom activities suggested by CBSE in the Handbook of 21st century 21st-Century Learning Skills to assess creativity and innovation in the classroom teaching-learning process are-

- Image talk- In this activity, learners will use various images to express their opinions and views.
- S.C.A.M.P.E.R- In this activity, S.C.A.M.P.E.R refers to Substitute, Combine, Adapt, Modify, Put, Eliminate, Reverse. It involves questioning and testing new ideas from different angles. For example- "Substitute: What would happen to the task if we exchange X with Y? Combine: what would happen to the task if we combine X and Y? Adapt: What changes would need to be made to adapt this task to a different context? Modify: what could we modify to create more value on this task? Put: what other uses or applications might this task have? Eliminate: what could we remove from the task to simplify it? Reverse: how could we reorganize this task to make it more effective?"
- Creative Space- In this activity, space for creative activities like drama, painting etc. is provided to the learners.
- Alternative ways of learning lesson- In this activity, teachers encourage learners to present their own versions of the story or some new ending of the story.
- Project-based learning- In this activity, learners enquire about a problem, investigate it deeply and analyse it thoroughly to find novel solutions to that problem.
- Two is Enough – In this activity, learners are provided with two shapes or colours only and they are asked to draw as many as things they can draw out of those two shapes.
- Let them Free- In this activity, learners are taken outside the classroom and left free to observe.
- Give a Break- In this, learners are given time off from their classes to pursue their interests and hobbies.

Collaboration

Collaboration involves working effectively with others to achieve common goals, whether in small groups or larger teams. In a 21st-century educational framework, collaboration is a critical skill for success in both academic and professional contexts. Approaches of CBSE towards the promotion of Collaboration as a 21st-century learning skill include a proposal for team-based learning, collaborative extracurricular activities and peer learning. "Collaboration in education is essential for developing democratic and communicative habits, encouraging learners to work together and learn from each other" (Dewey, 1916). "Collaboration stimulates cognitive development by allowing individuals to see different perspectives, promoting assimilation and accommodation of knowledge." (Piaget, 1954)

Certain activities suggested to foster Collaboration by CBSE in the Handbook of 21st Century 21st-Century Learning Skills are-

- Save the last word for me- In this activity, learners actively participate through active listening and active speaking, in groups. For example- learners select a text, read and respond to that text, and then share in groups.
- Hands-on project- In this activity, an experiential learning strategy is used. Learners are involved in hands-on activities.
- Chain Game- In this activity, collaboration is fostered. For example- word chain games, and conversation chain games.
- Search to win- In this activity, the teacher will divide learners into groups and give them questions. Learners will have to find the answers through the clues given by the teachers.
- Dumb Charades- In this activity, learners are divided into groups. Teachers prepare chits with topics. Then learners will act out that topic or concept, and the rest of the learners will try to decipher it.

Communication-

Communication refers to the ability to effectively express ideas and information through a variety of mediums, whether it be verbal, written, or digital communication. It is crucial in a globally connected world where clear and effective interaction is required. CBSE recommendations and NEP 2020 promotion about the application of Communication skills are Language proficiency, Digital Literacy and LSRW skills. Some strategies mentioned in the CBSE Handbook to foster communication skills are-

- Guide for the Blindfolded- In this activity, the teacher arranges the classroom in an unfamiliar way. Then learners are paired up and one of them is blindfolded. Another partner will guide the blindfolded person to find the way using only the words.
- Silence-Talk Day- In this activity, learners interact via non-verbal communication cues.
- Talk-in-pairs- In this activity, learners are asked by teachers to make pairs with those students whom they do not know much about. They are then given time to know much about each other. This will improve their communication skills.
- Feelings are important- In this activity, a board will be set-up where daily different feelings are written. Then, learners will choose one from them and write about how they feel about it.
- Learners' class- In this activity, learners are asked to organise the class themselves.

3. Research Questions

1. What is the role of 4C's (critical thinking, creativity, collaboration, and communication) within the NEP 2020 framework, and how do they contribute to its objectives?
2. How are the 4C's integrated into the classroom teaching-learning process?
3. What are the barriers faced by educators and institutions in implementing the 4C's in the classroom teaching-learning process?
4. In what ways does the integration of 4C's transform the teaching-learning process?
5. How relevant are the 4C's in the context of NCFSE 2023?

4. Research Objectives

1. To study the role of 4C's (critical thinking, creativity, collaboration and communication) in the NEP 2020 framework.
2. To study the integration of 4C's in the classroom teaching-learning process.
3. To identify the barriers in the implementation of 4C's in the classroom teaching-learning process.
4. To study the transformative nature of the integration of 4C's in the teaching-learning process.

5. To study the relevance of 4C's as per NCFSE 2023.

5. Operational Definitions

4C's – In this study, 4C's refer to the skills of creativity, critical thinking, communication, and collaboration that are essential 21st-century learning skills.

NEP 2020- In this study, NEP 2020 refers to the New Education Policy which came out in 2020 under the Ministry of Education in Indian academia.

Transforming Indian Education- In this study, Transforming Indian Education refers to the transformation that is happening in the context of Indian Education.

6. Research Methodology

This paper adopts a Systematic Literature Review as the research methodology. Various national and international research articles on the themes of 4C's, NEP 2020 and the Indian Education system are extensively read.

7. Review of related literature

The 4Cs of learning skills—critical thinking, communication, collaboration, and creativity—are foundational in 21st-century education (Trilling & Fadel, 2009). These skills align closely with global frameworks, such as the Framework for 21st Century Learning by P21, which emphasizes preparing learners for dynamic, interconnected environments. Critical thinking fosters problem-solving and decision-making (Paul & Elder, 2014), while communication and collaboration are essential for teamwork and cross-cultural competence in a globalized world. Creativity, as highlighted by Robinson (2011), is crucial for innovation and adaptability.

The National Education Policy (NEP) 2020 integrates these competencies to revamp Indian education. The policy emphasizes critical thinking and creativity through multidisciplinary approaches, experiential learning, and competency-based curricula. It promotes collaboration and communication via group projects, blended learning, and the integration of technology, including digital and multilingual platforms (Government of India, 2020). Furthermore, NEP's shift toward holistic, flexible, and inquiry-based education mirrors international best practices, bridging traditional values and modern pedagogies. By embedding the 4Cs, NEP 2020 aims to empower learners with the skills necessary for lifelong learning and global citizenship.

8. Discussions

8.1 Role of 4C's (Critical Thinking, Creativity, Collaboration, and Communication) in the NEP 2020 Framework

The National Education Policy (NEP) 2020 emphasizes the development of 21st-century skills through the 4C's—Critical Thinking, Creativity, Collaboration, and Communication. These skills are seen as integral to transforming students into independent thinkers, problem-solvers, and innovators who can thrive in a globalized world. NEP 2020 prioritizes competency-based learning over rote memorization and encourages an interdisciplinary approach to education, enabling students to connect concepts across subjects. The policy recognizes that fostering the 4C's will equip learners with essential life skills and employability competencies (Ministry of Education, 2020).

Key highlights of the NEP 2020 regarding the 4C's:

- Critical Thinking: Encourages logical reasoning, problem-solving, and evidence-based learning.
- Creativity: Promotes innovation, imagination, and experiential learning.
- Collaboration: Stresses teamwork, peer interaction, and collective problem-solving.
- Communication: Highlights effective verbal, written, and digital communication skills as essential for success.

NEP 2020 calls for a shift from teacher-centered instruction to student-centered approaches that foster active engagement and application of the 4C's in real-life contexts (Kumar, 2021).

Chiruguru (2020) emphasized the significance of the foundational 4Cs—critical thinking, communication, collaboration, and creativity—for modern learners. He argued that while the traditional "Three Rs" (reading, writing, and arithmetic) were once sufficient for literacy and education, the demands of the global society now require proficiency in the 4Cs. Highlighting creativity, Chiruguru cited Sir Kenneth Robinson, who asserted that creativity should hold the same importance as literacy in education. Furthermore, Chiruguru noted that technological advancements have made collaboration more accessible and essential, making it a critical skill for modern learners.

The CBSE 21st Century Skills Handbook, an initiative by the Ministry of Education, India, outlines essential 21st-century skills categorized into learning skills (4Cs), literacy skills, and life skills. The handbook emphasizes a shift from knowledge acquisition to the application of skills, advocating for project-based learning as an effective strategy to develop the 4Cs. It also provides practical guidance for teachers to adapt their pedagogy and incorporate classroom activities that foster these competencies.

8.2 Integration of 4C's in the Classroom Teaching-Learning Process

The study revealed that integrating the 4C's into the classroom can significantly enhance student engagement and learning outcomes. The following strategies have been identified as effective in embedding the 4C's:

- Project-Based Learning (PBL): Encourages collaboration, creativity, and critical thinking through real-world projects.
- Inquiry-Based Learning: Promotes critical thinking by encouraging students to ask questions, analyze data, and develop solutions.
- Brainstorming Sessions: Enhance creativity and communication skills by fostering idea-sharing.
- Group Activities and Peer Discussions: Develop collaboration and communication while encouraging active learning.
- Technology Integration: Use of digital tools such as interactive platforms, videos, and online collaboration tools to facilitate the 4C's.

Teachers adopting these approaches reported a marked improvement in students' problem-solving skills, creativity, and their ability to work in teams. However, successful integration requires teacher training, appropriate resources, and curriculum flexibility (Mishra & Sharma, 2022).

8.3 Barriers in the Implementation of 4C's in the Classroom Teaching-Learning Process

While the NEP 2020 strongly advocates for the development of 4C's, several barriers to implementation were identified:

1. Lack of Teacher Training: Many educators lack the skills and knowledge to effectively integrate 4C-based pedagogies in the classroom.
2. Rigid Curriculum: Traditional exam-oriented curricula often prioritize rote learning over skill development.

3. Resource Constraints: Insufficient access to technology, learning materials, and infrastructure hinders the implementation of innovative teaching strategies.
4. Assessment Limitations: Existing assessment methods focus on knowledge retention rather than evaluating critical thinking, creativity, or collaboration.
5. Large Class Sizes: Individual attention and fostering collaboration become difficult in overcrowded classrooms.

Addressing these barriers requires systemic changes, including teacher capacity building, curriculum redesign, and resource allocation (Rao et al., 2023).

8.4 Transformative Nature of the Integration of 4C's in the Teaching-Learning Process

The integration of the 4C's has demonstrated transformative effects on the teaching-learning process, including:

- Enhanced Student Engagement: Active learning methods like group discussions and project work increase student participation and interest.
- Improved Learning Outcomes: Students develop deeper conceptual understanding, problem-solving abilities, and creativity.
- Holistic Development: The focus on 4C's nurtures emotional, social, and cognitive skills, preparing students for life beyond school.
- Teacher Transformation: Teachers transition from knowledge providers to facilitators of learning, guiding students to explore, innovate, and collaborate.

Evidence from schools implementing 4C's shows that students become more confident, adaptive, and capable of applying their learning in diverse situations (Patel, 2022).

Thornhill-Miller et al. (2023) investigated the integration of creativity, critical thinking, communication, and collaboration as core competencies required by the evolving global workforce. Similarly, Laal and Laal (2012) highlighted collaborative learning's role in fostering critical thinking, communication, and interpersonal skills. Their study underscored the value of peer interaction, mutual problem-solving, and learner-centred approaches, identifying elements such as positive interdependence, accountability, and group processing as key to effective collaborative learning.

Critical thinking has been extensively explored in studies by Subitha (2022), Barseghyan (2022), and others, who underscored its importance for social transformation and independent thinking. Techniques like Socratic questioning, brainstorming, and problem-solving activities were highlighted as essential tools for developing critical thinking. Bahian (2024) proposed dimensions for assessing critical thinking using the Watson-Glaser Critical Thinking Test. Paul and Elder (2007), along with Kusumaryani (2021), emphasized the role of Socratic questioning in fostering critical thinking and communication skills in educational contexts.

Creativity, a cornerstone of the 4Cs, was explored by Foster & Schleicher (2022), who examined its role in education as a 21st-century skill. Noddings (2013) identified gaps in standardized curricula that neglect creativity, highlighting the need to prioritize creative thinking in teaching strategies. Studies by Combs et al. (2009) and Awamleh et al. (2012) proposed models and dimensions to assess and cultivate creative abilities, providing a robust foundation for integrating creativity into the learning process.

8.5 Relevance of 4C's as per NCFSE 2023

The National Curriculum Framework for School Education (NCFSE) 2023 aligns with NEP 2020's vision and underscores the relevance of the 4C's for future-ready learners. NCFSE 2023 integrates the 4C's as

core components across all stages of learning—Foundational, Preparatory, Middle, and Secondary—to foster:

- Critical Thinking: Through inquiry-based and experiential learning.
- Creativity: By emphasizing arts integration, innovation labs, and design thinking.
- Collaboration: Through peer learning, group projects, and co-curricular activities.
- Communication: By enhancing multilingualism, digital literacy, and interpersonal skills.

The NCFSE emphasizes the importance of contextual, real-life application of the 4C's, ensuring students develop the competencies needed to address contemporary challenges (NCERT, 2023).

This body of literature underscores the interconnectedness of the 4Cs and their essential role in preparing learners for the challenges of a technology-driven, globalised world. These studies provide a strong foundation for integrating these skills into pedagogical practices to create adaptable, future-ready learners.

Conclusion

Integrating the 4C's—Critical Thinking, Communication, Collaboration, and Creativity—within the NEP 2020 marks a pivotal step in transforming Indian education. By shifting the focus from rote learning to skill development, the policy equips learners with the tools to navigate the complexities of the 21st century. It promotes a learner-centric approach that nurtures innovation, adaptability, and real-world problem-solving. As these competencies become integral to teaching and learning, they pave the way for a more holistic and inclusive education system. Ultimately, NEP 2020 envisions creating future-ready individuals capable of contributing meaningfully to a dynamic, globalised society.

References

1. Awamleh, H., Farah, Y. A., & El-Zraigat, I. (2012). The Level of Creative Abilities Dimensions According to Torrance Formal Test (B) and Their Relationship with Some Variables (Sex, Age, GPA). International Education Studies, 5(6). https://doi.org/10.5539/ies.v5n6p138
2. Bahian, M. A., Nonan, K. R. G., Nonan, K. T. G., Alarcon, J. L. P., Wayas, K. J. B., Loyloy, L. M., Sacupayo, G. L. B., & Sayson, R. S. (2024). Measuring the Level of Critical Thinking Ability of the Students using Watson-Glaser Appraisal. Ignatian International Journal for Multidisciplinary Research, 4–4, 1529–1530. https://doi.org/10.5281/zenodo.11070889
3. Barseghyan, L. (2022). On the importance of teaching critical thinking. Foreign Languages in Higher Education. (https://www.semanticscholar.org/paper/ON-THE-IMPORTANCE-OF-TEACHING-CRITICAL-THINKING-Barseghyan/e6dfb1cbae20bbaccef7498994f2c3f7bbdfc4d8)
4. Combs, L. B., Cennamo, K. S., & Newbill, P. L. (2009). Toward A Conceptual Model Of Creative And Critical Thinking Processes. Developing Critical and Creative Thinkers, 49(5), 3–14.
5. Chiruguru, Dr & Chiruguru, Suresh. (2020). The Essential Skills of 21st Century Classroom (4Cs). 10.13140/RG.2.2.36190.59201.
6. Foster, N., & Schleicher, A. (2022). Assessing Creative Skills. Creative Education, 13, 1-29. https://doi.org/10.4236/ce.2022.131001
7. Kumar, A. (2021). Implementing NEP 2020: A Roadmap for 21st Century Skills Development. Journal of Educational Policy Studies.
8. Kusmaryani, W. (2021). The Effect of Socratic Questioning Method in Improving Students' Speaking Skill and Critical Thinking in English as a Foreign Language Learning. Advances in Social Science, Education and Humanities Research, 619, 289-295.

9. Laal, M., & Laal, M. (2012). Collaborative learning: What is it?. Procedia - Social and Behavioral Sciences, 31, 491-495. doi:10.1016/j.sbspro.2012.06.885

10. Ministry of Education. (2020). National Education Policy 2020. Government of India.

11. Mishra, R., & Sharma, S. (2022). The Role of Teachers in Integrating Critical Thinking and Creativity in Indian Classrooms. Educational Review Journal.

12. NCERT. (2023). National Curriculum Framework for School Education 2023. National Council of Educational Research and Training.

13. Patel, M. (2022). Transformative Pedagogies: A Study of Collaborative and Creative Classrooms. International Journal of Pedagogical Innovation.

14. Rao, P., Gupta, N., & Das, A. (2023). Barriers to Implementing 21st Century Skills in Indian Classrooms. Indian Journal of Educational Research.

15. Subitha, G.V. (2022). Education for Critical Thinking. National Institute of Educational Planning and Administration (NIEPA).

16. Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. Journal of Intelligence, 11.

17. UNESCO. (2015). The futures of learning 2: What kind of learning for the 21st century? [PDF]. UNESCO Digital Library. https://unesdoc.unesco.org/ark:/48223/pf0000242996