

## SKILL DEVELOPMENT IN HIGHER EDUCATION

### ABOUT THE BOOK

The education system in general and higher education has been redesigned by visionary document on NEP 2020. The new paradigm shifts in education enable the aspirants to access quality higher education to meet their needs globally. Global demands will only be satisfied by adopting various skills in education where the twenty-first-century learners can be benefited. The economic development of the country is well associated with skill education. The main objective and focus of the book is to familiarize various aspects mentioned in the NEP 2020 for the development process by integrating skills in education, which is acquired by high quality research. This book is useful for research scholars and students pursuing various specialized courses to strengthen their knowledge related to skill education.

### ABOUT THE EDITORS

**Dr. Ramesh. M** is presently working as an Assistant Professor of Education at Indira Gandhi National Tribal University Amarkantak, Madhya Pradesh. He did M.Sc. (Botany), M.Ed., UGC-NET, and Ph.D. (Education) from the Centre of Advanced Study in Education [CASE], The Maharaja Sayajirao University of Baroda, Vadodara. He worked as UGC Post-Doctoral Fellow at Pondicherry University. He is having more than eight years of experience in Research and teaching. His area of specialization are Science Education, Teacher Education, Inclusive Education and Environmental Education. He has published 22 research articles in National and International journals, 7 chapters in edited books, and 47 papers presented in National and International seminars/conferences. He served as a resource person for the seminars, workshops, and module development. He completed 03 research projects funded by ICSSR, PMMMNMTT, Central University of Kerala, and NCERT.

**Dr. Maria Josephine Arokia Marie. S.** presently is working as Assistant Professor of Education at Indira Gandhi National Tribal University Amarkantak, Madhya Pradesh. She did M.Sc. (Chemistry), M.Phil. (Chemistry), M.Ed., Ph.D. (Education), UGC-NET, and SRF, and has more than seven years of experience in Research and teaching Science Education, Teacher Education, Educational Technology, Blended Learning, and Educational Psychology. To her credit, she has published 21 research articles in National and International reputed journals, Scopus indexed and UGC Care listed journals. She contributed her research papers as chapters in many books. She has organized 2 National seminars and completed ICSSR-IMPRESS Major project and one project from Rajya Siksha Kendra, Bhopal. Under her guidance 1 Phd awarded and 2 are going. She is a member of various Academic bodies and a reviewer for research journals. Her aspirant tentacles try to reach even far-flung areas to promote education and developmental activities to scale new peaks in social development.

**Prof. Gyanendra Kumar Rout** is currently working as Head, Department of Education, Indira Gandhi National Tribal University, Amarkantak (MP), India. He has published 01 book, and 48 research publications in National and International journals apart from that he has presented papers in 11 International and 52 National Seminars/Conferences. Under his research supervision one Ph.D. Degrees in Education were awarded and currently guiding 4 Ph.D. Scholars. He has completed 1 minor and 1 major project. He is a Life Member of the Indian Association of Teacher Educators (IATE) and a Life Member of the Indian Association of Applied Researchers (IAAR). He has delivered several extension lectures and enlightened the participants.

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Dr Ramesh M.  
Dr. Maria Josephine Arokia Marie. S.  
Prof. Gyanendra Kumar Rout

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## Manglam Publications

K-129, Gali No. 3, 3½ Pustha Main Road,  
Near Shiv Om Jewellers, Gautam Vihar, Delhi-110053  
Mob. : +91 9811477588, 9540220106  
E-mail: manglam.publishers@rediffmail.com  
Website: www.manglampublications.com

Rs. 1150/-

ISBN 978-81-963658-7-5



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*Editors*

**Dr. Ramesh. M**

Assistant Professor of Education  
Indira Gandhi National Tribal University,  
Amarkantak, Madhya Pradesh

**Dr. Maria Josephine Arokia Marie. S**

Assistant Professor of Education  
Indira Gandhi National Tribal University,  
Amarkantak, Madhya Pradesh

**Prof. Gyanendra Kumar Rout**

Head, Department of Education  
Indira Gandhi National Tribal University,  
Amarkantak, Madhya Pradesh



**MANGLAM PUBLICATIONS  
DELHI-110053 (INDIA)**

*Published by :*

**MANGLAM PUBLICATIONS**

K-129, Gali No.-3, 3½ Pusta Main Road,  
Near Shiv Om Jewellers, Gautam Vihar,  
Delhi-110053, India.

Mob. : 9868572512, 9811477588

E-mail : manglam.books2007@rediffmail.com

web. : www.manglampublications.com

**Skill Development in Higher Education**

© Editors

First Edition: 2023

ISBN: 978-81-963658-7-5

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**PRINTED IN INDIA**

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Published for Manglam Publications, Delhi-110053, Laser Type setting at Shahabuddin Computers, Delhi. Printed at Infinity Imaging Systems, Delhi.

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## Chapter-3

# Skills Required for the 21st Century in India- Through Stem Curriculum and Gamification

-Antony Philomena M.<sup>1</sup> & Dr. Karthik Deepa<sup>2</sup>

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### ABSTRACT

*This study demonstrates the perception of STEM curriculum-related skills and abilities, which enhance the Skills and Values required for 21st-century learning. STEM education is an acronym for the field of study in the categories of Science, Technology, Engineering, and Mathematics. Nowadays, we are facing a huge increase in Labour demand and unemployment for professionals such as Technology and Technical related problems and other professional's fields like Healthcare, transportation, etc. which became a major concern for Governments, Organizations, and Educational systems. To rectify this problem STEM curriculum helps us to move forward through the teaching-learning process of STEM which gives better outcomes by the Integration of emerging technologies and digital content through Gamification. Gamification increases knowledge*

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<sup>1</sup> Research Scholar, Dept of Education, Avinashilingam Institute for Women, Coimbatore, TamilNadu

<sup>2</sup> Associate Professor, Dept of Education, Avinashilingam Institute for Women, Coimbatore, TamilNadu



retention by approximately 40 percent. As a result, gamification is an extremely effective strategy for ensuring that students remember what they learn well after the end of their courses. STEM curriculum and its learning and testing method through Gamification paves the way for self-employment and helps us to blend with the Ideas of NEP 2020. STEM subjects are crucial for students to study because they provide a foundation for skills such as Critical thinking, Problem-solving, life -skills, Technology and deeplearning, Creative thinking patterns, etc. Skills such as Critical thinking and problem-solving are in high demand in a wide range of fields and industries including technology and finance. Therefore, the STEM curriculum helps us to prepare for the future- Global competition, career opportunities, and a good perk too. Many government agencies and non-profit organizations advocate and fund for STEM education. Our modern-day world needs professionals with abilities to find upfront answers to real-world problems, and STEM education -a perfect aid for a young mind to develop all these abilities. Already, the need for STEM education in India is imperative and for sure STEM players will rule the 'Jobs of tomorrow'.

**Keywords:** STEM curriculum, Gamification, 21st-century skills, Employment.

## Introduction

The 21st century has brought about rapid changes in the world, including advancements in technology and a shift towards a knowledge-based economy. In order to thrive in this new era, students in India need to acquire a set of skills that will enable them to navigate the challenges and opportunities of the future. STEM curriculum and gamification can play a crucial role in developing these skills. Here are some of the key skills required for the 21st century that can be developed through STEM curriculum and gamification:

1. **Critical thinking and problem-solving:** STEM curriculum and gamification provide opportunities for students to develop critical thinking and problem-solving skills by engaging in hands-on and project-based learning. They are challenged to think creatively

and come up with innovative solutions to real-world problems.

2. **Digital literacy:** In today's world, digital literacy is an essential skill. STEM curriculum and gamification incorporate technology into learning, allowing students to become familiar with different digital tools and platforms.
3. **Collaboration and teamwork:** STEM curriculum and gamification provide opportunities for students to work in teams and collaborate on projects. This helps them develop social skills and learn how to work effectively with others.
4. **Communication skills:** STEM curriculum and gamification provide opportunities for students to develop communication skills through presentations, discussions, and debates. They learn how to articulate their ideas and communicate effectively with others.
5. **Creativity and innovation:** STEM curriculum and gamification encourage students to think outside the box and come up with creative solutions to problems. They are encouraged to experiment and take risks, which fosters a culture of innovation.
6. **Entrepreneurship and leadership:** STEM curriculum and gamification provide opportunities for students to develop entrepreneurship and leadership skills. They learn how to identify opportunities, take initiative, and lead teams towards a common goal. Overall, STEM curriculum and gamification can play a crucial role in developing the skills required for the 21st century. By providing students with opportunities to engage in hands-on and project-based learning, work in teams, and develop digital literacy, critical thinking, problem-solving, communication, creativity, innovation, entrepreneurship, and leadership skills, they will be better equipped to succeed in the rapidly changing world.

*NEP 2020 and 21st Century learning:* The National Education Policy (NEP) 2020 is a comprehensive framework for the development of education in India. It aims to transform the education system and make it more responsive, inclusive, and holistic. The NEP 2020 was approved by the Indian government in July 2020 after a gap of 34 years since the last education policy was formulated in 1986. The NEP 2020 envisions a 21st century learning system that prepares students for the rapidly changing world by fostering critical thinking, creativity, and problem-solving skills. It emphasizes the need for a learner-centered approach that focuses on the individual needs, interests, and talents of each student.

The policy advocates for the integration of technology in education and emphasizes the importance of digital literacy. It also recognizes the role of teachers as facilitators and encourages their professional development. The NEP 2020 also proposes several reforms in the higher education sector, including the establishment of a single regulator for higher education, multiple *entry and exit* points in degree courses, and the introduction of multidisciplinary education. Overall, the NEP 2020 seeks to create a more flexible, inclusive, and dynamic education system that empowers students to succeed in the 21st century.

### **How can We Correlate Gamification and NEP 2020?**

Gamification can be seen as a tool to support the implementation of NEP 2020. The NEP 2020 emphasizes the need for a learner-centered approach that focuses on the individual needs and interests of each student. Gamification can help achieve this by making learning more engaging and interactive, allowing students to take ownership of their learning and explore at their own pace. Incorporating gamification elements in education can also promote critical thinking, problem-solving skills, and creativity, which are essential skills required by NEP 2020. Gamification can provide an opportunity for students to practice and apply these skills in a safe and engaging environment. Additionally, the NEP 2020 emphasizes the importance of digital literacy and the use

of technology in education. Gamification can leverage technology and digital tools to create immersive learning experiences that are interactive, personalized, and accessible. Furthermore, gamification can also promote collaboration and teamwork, which are essential skills required for the multidisciplinary approach proposed by NEP 2020. Through gamification, students can work together to solve problems, complete quests, and achieve shared goals. In conclusion, gamification can serve as a powerful tool to support the implementation of NEP 2020 by creating an engaging, interactive, and personalized learning experience that fosters critical thinking, problem-solving skills, creativity, and collaboration.

**NEP 2020 and STEM curriculum:** The National Education Policy (NEP) 2020 emphasizes the importance of science, technology, engineering, and mathematics (STEM) education in creating a workforce that is equipped to meet the challenges of the 21st century. The NEP 2020 recognizes the critical role of STEM education in fostering innovation, creativity, problem-solving, and entrepreneurship.

To support the implementation of STEM education, NEP 2020 proposes the following reforms in the curriculum:

- 1. Integration of STEM subjects:** NEP 2020 emphasizes the need to integrate STEM subjects to create a multidisciplinary approach to learning. This approach will help students to connect STEM concepts across different subjects and apply their knowledge in real-life situations.
- 2. Focus on project-based learning:** The NEP 2020 advocates for a shift towards project-based learning that allows students to apply their knowledge and skills to solve real-world problems. This approach fosters critical thinking, problem-solving skills, and creativity.
- 3. Emphasis on hands-on learning:** NEP 2020 recommends the use of hands-on learning approaches such as experiments, fieldwork, and practical activities to promote experiential learning.

4. ***Inclusion of coding and computational thinking:*** NEP 2020 recognizes the importance of coding and computational thinking in the digital age and proposes the inclusion of these skills in the curriculum.

Overall, the NEP 2020 emphasizes the importance of STEM education in creating a skilled workforce for the 21st century. It proposes several reforms in the curriculum to support the implementation of STEM education, including the integration of STEM subjects, project-based learning, hands-on learning, and the inclusion of coding and computational thinking.

### **Less Stressful and More Successful Classroom According to NEP 2020**

The National Education Policy (NEP) 2020 emphasizes the need for a less stressful and more successful classroom environment that fosters the holistic development of students. The NEP 2020 recognizes that the current education system places undue stress on students and fails to promote their overall well-being.

To support the creation of a less stressful and more successful classroom environment, NEP 2020 proposes the following measures:

1. ***Reducing the curriculum load:*** NEP 2020 recommends reducing the curriculum load and promoting experiential and hands-on learning. This approach will enable students to learn at their own pace, explore their interests, and reduce the stress associated with exam-oriented learning.
2. ***Flexible and multidisciplinary approach:*** The NEP 2020 emphasizes a flexible and multidisciplinary approach to learning that enables students to explore different subjects and interests. This approach will help reduce the stress associated with a rigid and compartmentalized curriculum.
3. ***Emphasizing life skills and values:*** The NEP 2020 proposes the inclusion of life skills and value education in the curriculum. This approach will enable students



to develop essential life skills such as critical thinking, problem-solving, communication, and empathy, which will promote their overall well-being.

4. **Teacher training and support:** The NEP 2020 recognizes the critical role of teachers in creating a less stressful and more successful classroom environment. The policy proposes the provision of training and support to teachers to enable them to implement student-centered and experiential learning approaches.

Overall, the NEP 2020 emphasizes the need to create a less stressful and more successful classroom environment that fosters the holistic development of students. The policy proposes several measures to achieve this, including reducing the curriculum load, promoting a flexible and multidisciplinary approach, emphasizing life skills and values, and providing teacher training and support.

## **Conclusion**

STEM (Science, Technology, Engineering, and Mathematics) education is important for the development of skills such as problem-solving, critical thinking, and creativity, which are highly valued in the workforce and can lead to a variety of career opportunities, including self-employment. Gamification, or the use of game design elements in non-game contexts, can also play a role in promoting self-employment by engaging learners in fun and interactive learning experiences that foster entrepreneurial skills such as innovation, risk-taking, and collaboration. By integrating gamification into STEM education, students can develop a strong foundation in these skills, which can help them create and manage their own businesses and become self-employed. Additionally, the hands-on, project-based learning approach inherent in gamification can help students apply the concepts they learn in a practical setting, giving them real-world experience that they can use to launch and grow their own ventures.

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