Role of Life Skills in Promoting Mathematics Education with Reference to NEP 2020

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ABSTRACT

Life skills have been demonstrated to be a successful psychosocial intervention technique for encouraging students' good social and mental health. It plays a significant role in all aspects, including coping mechanism strengthening, emotional intelligence and self-confidence development, and critical thinking, problem-solving, and decision-making skills. To make learning more engaging and meaningful, NEP-2020suggested revamping the curriculum and pedagogy and changing the paradigm from content-based to experience-based learning. It emphasizes the value of mathematics and mathematical reasoning in emerging research-focused domains including data science, machine learning, and artificial intelligence.

Thus, mathematics is more about making generalizations, recognizing correlations, and refining logical reasoning and thinking than it is about "number work" or "computation." The main components of inquiry-based teaching include activities that involve posing, solving, and modelling problems. NEP- 2020 recognized the value of mathematical reasoning and how it can assist the nation in becoming a Vishwa guru. NEP -2020 gives kids the nutrition they need by making mathematics fascinating and engaging from the very beginning. Furthermore, as

coding fosters the development of computational skills and intuitive reasoning, middle schools should include coding curricula. The NEP-2020 emphasizes the value of combining life skills with mathematics education by emphasizing experiential learning and transdisciplinary learning. By illustrating how the development of vital life skills improves mathematical proficiency and, on the other hand, how mathematical education promotes the acquisition of crucial life skills, the study seeks to highlight the mutually beneficial relationship between life skills and mathematics education.

The paper reviews the theoretical foundations of life skills, mathematics education, and NEP 2020,providing a thorough comprehension of the fundamental ideas. It delves into the practical implementation of life skills in the mathematics classroom, providing examples of how concepts such as critical thinking, problem-solving, communication, and collaboration can be seamlessly integrated into mathematical curricula. It also discusses the challenges and barriers to implementing life skills in mathematics education, addressing issues related to teacher training, curriculum design, and assessment methodologies.

Keywords: Life Skills, Mathematics Education, NEP- 2020, Curriculum Integration

Introduction

Education is a methodical process that helps adults and children gain experience, information, skills, and a positive attitude. An individual becomes civilized, refined, cultured, and educated as a result. Its objective is to perfect a person. NEP-2020 is a groundbreaking document since it outlines the objective of skill-based education to empower young to become self-reliant. Realizing each student's full creative potential is a top priority according to the National Education Policy 2020. Its foundation is the notion that education should support the development of social, ethical, and emotional skills and dispositions in addition to cognitive skills, including "higher-order" cognitive skills like critical thinking and problem-solving, and "foundational skills" like literacy and numeracy.NEP- 2020 states that every aspect of the curriculum and pedagogy would be improved and redesigned. Curriculum and pedagogy reform at all levels will have as its main goal moving away from the existing culture of rote learning and toward accurate understanding and learning how to learn. Education will aim to develop students' cognitive capacities as well as their character, general wellbeing, and critical 21st-century skills.

It will be essential in preparing students for careers in the business. Humans are full of potential, which shows in our capacity to do extraordinary feats such as groundbreaking scientific discoveries, admirable social services, outstanding accomplishments in a variety of fields, and so forth. Psychologists think that we are all born with the potential to succeed. living skills are a wide range of competencies that help people successfully navigate the demands and obstacles of daily living. These abilities, which can greatly improve mathematics instruction, include creativity, critical thinking, problem-solving, teamwork, and communication.

Our potential can be realized and utilized with the aid of life skills. Even with all of our abilities, ambitions, and willpower, there are moments when obstacles brought on by inadequate life skills prevent us from achieving our goals. In actuality, life skills support us in living a competitive and fulfilling life in addition to helping us reach our full potential. It is not only an individual attempt to study mathematics.

Discussing and elucidating mathematical concepts requires teamwork and proficient communication abilities. India has a long tradition of superior mathematical knowledge. Indian mathematicians gave the rest of the world the number system, zero, astronomy, trigonometry, algebra, ratio, etc. Students who use mathematics are better able to comprehend concepts and conclusions accurately. It is the precise and quantifiable judgment of human existence and knowledge. It has become an essential component for the advancement of students' modern world and plays a major role in their daily lives. Math life skills enable students to effectively navigate a variety of challenging circumstances. Math-based life skills will assist pupils in developing transferable and general learning abilities as well as abilities for making wise judgments in life and at work. Given that the NEP has a clear vision for research, creativity, and innovation, mathematics will surely flourish in this new era. Students who gain life skills are frequently able to think more critically and, in the end, make more rational decisions. By improving their ability to evaluate risks, students will be able to make wiser decisions in both their personal and professional lives in the road.

This paper deals with life skills, the role of life skills in mathematics education, and how NEP 2020 promotes mathematics learning. It also tells us about strategies to integrate life skills in the school curriculum to enhance the teaching-learning process. This paper utilizes existing literature and documents related to mathematics education and life skills.

Life Skills

Competencies for consistently delivering high performance are skills. Being able to do something well requires learning it. It can be defined as the capacity for people to convert information and knowledge into particular behaviours and function well in situations requiring action. “Brooks (1984) To categorize life skills, an empirical approach was used. The Delphi study was used in collaboration with developmental psychology theorists(Erikson, 1963; Havighurst, 1972 and Kohlberg, 1973; 1976) and classified 305 life skills descriptors into four categories such as (i) interpersonal communication and human relations skills; (ii) problem-solving and decision-making skills; (iii) physical fitness and health maintenance skills; and (iv) identify development/ purpose in life skills”. Life skills refer to the capacity to take initiative and accept responsibility for acting in a certain way in a specific scenario to promote healthy living. Hamburg (1990) Life skills training is defined as the teaching of necessary skills for surviving, interacting with others, and thriving in a diverse society. Communication, interpersonal negotiation, self-control, and decision-making are examples of generic skills. All of the skills that support somebody in managing the problems of day-to-day life effectively as well as giving them confidence to deal with any scenario effectively are referred to as life skills. Life skills instruct students in the practical application of knowledge, attitudes, and abilities that are crucial building blocks for personal growth. Life skills are a collection of psychosocial and interpersonal abilities that can assist students in developing stress relieving, Self management, decision making, and effective communication skills may help them lead healthy and productive lives. Despite the likelihood that the precise nature and descriptions of life skills may vary across social and cultural situations, WHO investigation resulted in the identification of a core set of abilities for effective living WHO (1993). Life skills are therefore described as the capacity for adaptable and constructive behaviour that enables people to directed and controlled the demands and difficulties of daily life.

Life Skills Education

Education is the process of bringing a person's hidden potentials to light and assisting in their transformation into a wholesome being. One of the goals of education is to equip students with the skills they need to meet life's difficulties and function in a multicultural, dynamic society. Education in life skills refers to the range of abilities needed to shape an individual's character. Behaviors known as "life skills" enable people to adjust to and successfully navigate the rigors and obstacles of daily living. Typically, life skills education refers to the abilities pupils need to

maximize their potential in life. Broadly speaking, any talent desired to successfully navigate life's obstacles is frequently referred to as "life skills."

Therefore, it should be clear that everyone's list of the abilities they believe are most important in life may differ. Important tools for kids' general growth are provided by life skills education, such as how to socialize and make new friends and how to make decisions in any situations whether it be overcoming personal fears, dealing with a bully, or facing any other fears especially in the absence of parents and teachers.It helps students build their confidence and be more communicative, recognizing the impact of their actions. Life Skills education tries to resolve all the ill characteristics prevalent among adolescents. These psychosocial abilities effectively fulfill the demands, inclinations, and challenges of adolescents cautiously. It empowers the youth to be resilient in their developmental process. Life skills contain innumerable child-centric skills that are actively aware of them from knowing their shortcomings and recognizing their acquired skills.

Types of LifeSkills

There is no set or complete list of necessary life skills “International Commission on education “((*Learning: The Treasure within; Report to UNESCO of the International Commission on Education for the Twenty-First Century (Highlights) - UNESCO Digital Library*, n.d.)for 21st century appointed by UNESCO in 1993 under the chairmanship of Jacques Delors has focused on four pillars of learning that an individual needed for better life-

- **“Learning to Know:** Cognitive abilities Decisions making/ Problem solving skills Critical thinking skills
- **Learning to be:** Personal abilities Skills of increasing internal locus of control Skills for managing feelings and Skills for managing stress
- **Learning to do:** It calls for new types of skills, more behavioural than intellectual. The material and the technology are becoming secondary to human qualities and interpersonal relationships.
- **Learning to live together:** Interpersonal skills Interpersonal communication skills Negotiation/ Refusal Skills Empathy Cooperation and teamwork Advocacy skills”.((*Learning: The Treasure within; Report to UNESCO of the International Commission on Education for the Twenty-First Century (Highlights) - UNESCO Digital Library*, n.d.)

Life Skills according to UNICEF

UNICEF (1997) Comprehensive-Life Skills-Framework recognizes several levels of life skills:

- "Basic psychological and social skills (strongly shaped by cultural and social values);
- Situation-specific skills (e.g., negotiation, assertiveness, conflict resolution);
- Applied Life Skills" ((e.g., challenging gender roles or refusing drugs).

WHO Life Skills

The World Health Organization (WHO), Geneva, published an article in 1997 titled "Life Skills Education for Children and Adolescents in Schools." - Part I, Introduction to Life Skills for Psychosocial Competence, and Part II, Guidelines: Development and Implementation of a Life Skills Program, comprise the Mental Health Program. Part 1 covered ten distinct categories of core (general) life skills. They are adapted from "School-Based Life Skills Education for Children and Adolescents")."-Programme on Mental Health, World Health Organization, Geneva, 1997) as follow -

1. "Self Awareness: WHO defines it, "Self-awareness refers to our understanding of ourselves, our personalities, our strengths and weaknesses, our desires and dislikes".

2. Empathy: This is the ability of a person to understand the feelings of others in distress and helps in providing emotional support to them.

3. Effective communication: Effective communication is the capacity of effective verbal and nonverbal communication with others to establish and maintain effective social relationships with others.

4. Interpersonal Relationships: It's also known as survival or people skills. It is a vital life skill as well as the most important dimension of human intelligence. It encourages initiating and maintaining positive relationships with other persons and avoiding destructive relations with minimum disturbance.

5. Creative Thinking: It is the ability to produce new innovative ideas and translate them into actions with original thinking and helps a person to react in a flexible way to various challenges of life by exploring possible alternatives and evaluating them.

6. Critical Thinking: Critical thinking is self-directed, self-disciplined thinking based on logical reasoning and objectivity. It improves the quality of thinking and enables a person to analyse information and experiences logically and objectively.

7. Decision Making: It helps an individual to make correct decisions at the right time and to choose the best amongst the various alternatives. This is the ability to assess the pros and cons of various alternatives and, after analysing various options and their consequences, to convincingly accept responsibility for his/her decisions.

8. Problem Solving: Problem solving is an attempt of finding an appropriate way of attaining a goal when the goal is not readily available. It develops the ability to get out of difficult situations and achieve the goal without using anger, coercion, defiance and aggressive behaviour.

9. Coping with Emotion: Coping with emotion assists a person to know the feeling of himself and others. This enables a person to learn healthy, positive and safe ways to express their feelings. It helps in identifying the effect of emotions on behaviour and to learn to react with emotion appropriately and how to control the excessive emotion like anger and sorrow.

10. Coping with Stress: This skill enables an individual to recognize the source of stress, the effect of stress and technique to control stress and how to overcome it. (Do You Know the TOPLIFE SKILLS Recommended by The World Health Organization (WHO (2019)

Life Skills and Mathematics Education

The mathematization of a child's thought process is the primary objective of mathematics teaching in schools. The mathematical endeavor is centered on the pursuit of assumptions to logical conclusions and clarity of mind. Mathematics teaches pupils how to approach problem-solving and manage abstractions in a variety of ways. The basis of a top-notch mathematical education is the twin ideas that every student can learn mathematics and that every student must learn mathematics. In developing a child’s inner resources, the role that mathematics plays is largely about thinking. The mathematical Endeavour is centered on the pursuit of assumptions to logical conclusions and clarity of mind. There has been a lot written on life skills and the connection between schooling and employment. Undoubtedly, the majority of the abilities learned in the basic level are applicable to daily life. In addition to teaching students how to solve mathematical problems, mathematics education also teaches them how to approach issues of all types methodically and with the proper mindset.

Students gain Life Skills because they help kids become more analytical and problem-solving and because they better equip them to handle a variety of challenges in life. Scientists must be able to estimate quantities and make estimates when exact solutions are not accessible. The physicist Fermi gained notoriety by posing estimating issues drawn from daily living and demonstrating how they aided nuclear physics. A farmer uses a lot of estimation and approximation skills while estimating the yield of a specific crop. Such valuable abilities can be developed and honed with the help of school maths. A child can develop life skills in everyday situations by learning math.

Children who study mathematics are more aware of their surroundings and learn the significance of the physical environment they interact with on a daily basis. Children learn to grasp numbers and shapes through mathematics, but they also learn to link ideas, think rationally, and understand causes. Arithmetic generally teaches children to pay close attention to the relationships and patterns in things. According to Porter (2000), students will be more motivated to learn if they feel that the work they are doing has value and relevance to their lives. Without discriminating based on gender, the child must make active learning engaging and relevant to their qualities.

This will increase the students' skills and knowledge in the memory of mathematical concepts.(Sue Bredekamp, 1986). In actuality, youngsters do not find mathematics to be particularly interesting or challenging. Despite the fact that mathematics is a subject that is extremely beneficial to human life, many student shave not been able to experience the advantages of mathematics in the growth of thinking abilities, the construction of attitudes, development of all-around personality. Critical thinking and problem-solving are fostered by mathematics, which are essential life skills. Mathematics education contributes to the acquisition of life skills:

1. **Problem-Solving:** Critical thinking skills and problem-solving skills are fostered by mathematics, which are essential life skills. Students gain the ability to examine issues, deconstruct them into more manageable components, and create solutions. These problem-solving abilities are transferable to actual life circumstances, assisting people in making wise judgments.
2. **Financial Literacy:** Understanding personal finance, budgeting, saving, investing, and money management requires a solid mathematical foundation. These money management abilities are necessary for day-to-day living because they enable individuals to safeguard their financial future and make prudent financial decisions.

3. **Data Interpretation:** When it comes to understanding statistics in the news, analyzing graphs and charts, or making data-driven decisions in many fields, mathematics gives people the skills they need to evaluate and analyze data. In our data-driven world, having a solid understanding of data is crucial.
4. **Time Management:** People who study mathematics can improve their time-management and planning abilities. The capacity to plan ahead, set deadlines, and manage one's time well is essential for success in both the personal and professional domains.
5. **Logical Reasoning:** The use of logic in problem-solving, making decisions, and navigating difficult situations is facilitated by mathematical thinking.
6. **Communication Skills:** Mathematicians are often required to provide explanations for their procedures and findings. This promotes strong communication abilities, which are essential for putting ideas across clearly and persuasively in a range of real-world contexts.
7. **Resilience and Perseverance:** The study of mathematics instills tenacity and fortitude. People who struggle with arithmetic difficulties and overcome learning challenges develop a growth attitude, which is necessary for conquering barriers in life.
8. **Technology Proficiency:** As technology is ingrained in daily life more and more, mathematical skills are essential for comprehending and utilizing digital tools and software, which are essential life skills in the modern world.
9. **Numeracy:** For practical daily tasks like cooking, shopping, home renovation, and more, basic mathematical abilities like arithmetic and number comprehension are essential.
10. **Career Opportunities:** A solid background in mathematics paves the way for careers in disciplines including science, engineering, finance, technology, and data analysis. These professions frequently guarantee both work security and financial stability.
11. **Critical Thinking:** Mathematics education fosters the development of critical thinking skills, which are essential for evaluating data, reaching informed decisions, and resolving challenging problems in a range of life situations.
12. **Creativity:** Because math allows students to investigate patterns, shapes, and relationships, it can also be a creative subject that stimulates creativity and original thought.

Mathematics education seeks to impart to students the essential life skills necessary for success in a range of social, academic, and professional contexts, in addition to formulas and equations. Among these skills are the capacity for problem-solving, financial literacy, data interpretation, time management, logical reasoning, and communication. People can lead more successful and fulfilling lives when math education is paired with the acquisition of life skills.

Life Skills and Mathematics Education with Reference to NEP 2020

With its many provisions, the new National Education Policy (NEP), 2020 offers a framework for developing, fostering, encouraging, and multiplying mathematical thinking. The necessary reforms have been implemented to strike a balance between the demands of entrepreneurship and 21st-century employment, which is characterized by lateral, critical, and quantitative thinking. Without a question, mathematics and mathematical thinking will play a major role in India's future and in maintaining its leading position in the myriad developing sectors and professions that will include data science, machine learning, artificial intelligence, etc. As a result, throughout the academic years, starting at the foundational level, a greater focus will be placed on mathematics and computational thinking using a variety of creative methods, like the frequent use of games and puzzles that pique students' interest in and encourage their use of mathematics.

Activities pertaining to coding will be given in the Middle Stage. The NEP acknowledged the importance of using mathematical thinking and the necessity of doing so in order for the country to become vishwaguru. Mathematics is the cornerstone of all of the most cutting-edge technologies available today, including blockchains, AI, machine learning, and big data analytics. In addition to general engagement and enjoyment of learning, the integration of the humanities and arts with STEM (science, technology, engineering, and mathematics) has consistently demonstrated positive learning outcomes, such as increased creativity and innovation, critical thinking and higher-order thinking skills, problem-solving abilities, teamwork, communication skills, more in-depth learning and mastery of curricula across fields, increases in social and moral awareness, etc.

As a result, this Policy aims to change both the amount and quality of research conducted in India through a comprehensive approach. This includes significant changes to the way that education is taught in schools, with a focus on the scientific method and critical thinking, and more play and discovery-based learning. A major focus of the NEP 2020 is holistic development, which encompasses both life and

academic abilities. The goal of the policy is to guarantee that education fosters creativity, critical thinking, and problem-solving skills in addition to memorization. This means that math should be taught in the context of mathematics education as a tool for acquiring critical life skills rather than just as a topic.

It encourages teaching with an interdisciplinary approach. Mathematics is not a stand-alone subject; rather, it is related to other subjects. This method further strengthens students' critical thinking and problem-solving skills by assisting them in gaining a comprehensive understanding of topics and their applications. It introduces a change in evaluation methods from rote learning to competency-based learning. This shift in evaluation techniques pushes students to show that they can apply mathematical ideas to practical contexts in addition to their formal knowledge. This change encourages the growth of life skills.

NEP supports pupils to learn in their mother tongues and acknowledges the value of multilingualism. Better understanding and application of mathematical ideas and life skills may result from this. The policy encourages students to learn through hands-on activities, or experiential learning. This can include activities in mathematics education that call for critical thinking, cooperation, and problem-solving skills.

Strategies to Promote Mathematics Education through Life Skills

Life skills are not just traits that should be learned; they should also be practiced. Although lifes kills are often developed indirectly through skill and experience, they would be significantly developed if a dedicated life skills curriculum was implemented and integrated into scholastic and co-scholastic areas. Nivedita, & Singh B. (2016) and Prajapati, R., Sharma, B. & Sharma, (2017) have discussed techniques for imparting life skills in a classroom setting, including brain storming, role plays, small groups or buzz groups, The Following are some techniques to enhance life skills in students:

1. **Discussion:** Students benefit from discussion by deepening their knowledge of the subject matter and by getting the opportunity to learn from one another. Discussions enhance the development of understanding, assertiveness, and empathy skills. Additionally, it helps in students' communication skill development.
2. **Role-playing:** It offers a great opportunity to exercise a variety of life skills, including empathy since role-playing requires pupils to play the role of another person. A learner gains knowledge on how to approach prospective situations

in the actual world. This aids in deepening understanding of one's own emotions.

3. **Buzz Group:** Students work in small groups of five or six during this activity, and each group is given an assignment to complete. As a result, students get to know one another better and gain skills in peer assistance.
4. **Case Studies:** A situation, an event, or a character is described in a genuine or made-up story. The participants may need to brainstorm solutions to the disagreement in order to address the challenge. It often provides ways to solve problems or challenges the author's problem-solving skills.
5. **Miming:** Miming is acting nonverbally through face expression, physical movement, gestures, and signals. In contrast to drama, just actions are used to convey the idea or scenario. Miming is appropriate for conveying delicate messages.
6. **Poetry and Recitals:** These are pieces that convey events, topics, and situations in a clear and accurate manner. They transmit ideas, behaviors, beliefs, and other experiences. To teach pupils a range of life skills, they can be presented as songs, chants, recitations, or depictions. They can be employed to sway people's behavior in the desired direction by making emotional appeals to them.
7. **Question and Answer Method:** It is a process where a teacher or student seeks to learn knowledge by posing questions and receiving responses from the recipient. In most cases, the learner and the teacher exchange information. Due of the way it promotes learners' creativity and critical thinking, it is a successful technique of teaching life skills education. Therefore, it inessential for efficient teaching and learning.
8. **Educational Games and Simulations:** Activities that aim to imitate the real experience are called simulations. Students engage in gaming as an activity. Games encourage active learning, judgment, conversation, and enjoyment. Participants are encouraged to compete in a healthy way as they work hard to demonstrate their abilities. Students can use their information, attitude, and talents in this way. It can help with the development of abilities including decision-making, problem solving, and critical thinking.

Conclusion

Mathematics education seeks to impart to students the essential life skills necessary for success in a range of social, academic, and professional contexts, in

addition to formulas and equations. Since mathematics is essential for the development of critical life skills, there is a substantial correlation between mathematics education and the development of life skills. NEP 2020 in India recognizes the vital link between life skills and mathematical education. By combining mathematics instruction with the development of essential life skills, it aims to provide a more comprehensive and practical approach. It is expected that this approach would give students the tools they need to thrive in their future personal and professional lives.

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