NEW EDUCATION POLICY :2020

Nation Building Perspective

EDITED BOOK

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नई शिक्षा नीति 2020

राष्ट्र निर्माण के परिप्रेक्ष्य में

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आदरणीय निदेशक महोदय जी
को सप्रेम भेंट।

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PREFACE

National Education Policy 2020: Nation Building Perspective

In an era marked by rapid globalisation, technological advancements, and evolving societal dynamics, the importance of education as a catalyst for nation-building cannot be overstated. Education is the cornerstone upon which the foundation of any nation is built, shaping the minds, values, and aspirations of its citizens. It is in this context that the National Education Policy of 2020 emerges as a landmark document, providing a visionary roadmap for transforming the educational landscape of our nation. "National Education Policy-2020: A Nation-Building Perspective" seeks to shed light on the significance, implications and potential of this comprehensive policy framework. Through a careful analysis of its principles, objectives and recommendations, this book aims to equip policymakers, educators, researchers and stakeholders with a deeper understanding of the transformative potential of the National Education Policy.

The chapters within this volume draw upon the collective wisdom and expertise of eminent educators, scholars, and practitioners who have dedicated their lives to the pursuit of quality education and nation-building. Their diverse perspectives and experiences enrich the discourse, highlighting the multifaceted nature of the policy and its impact on various dimensions of education. We begin by exploring the historical context and rationale behind the formulation of the National Education Policy-2020, tracing its roots to the early years of our nationhood and the subsequent educational reforms that have shaped our system. Through critical analysis and insightful reflections, we navigate

through the key pillars and provisions of the policy, examining its potential to foster inclusive and equitable education for all.

Furthermore, this book delves into the policy's emphasis on holistic and multidisciplinary learning, the integration of technology in education, and the promotion of research and innovation. It also examines the role of teachers as transformative agents and the importance of early childhood education in laying strong foundations for lifelong learning. One of the crucial aspects addressed in this volume is the policy's focus on cultural and linguistic diversity, promoting the preservation and celebration of India's rich heritage from a nation-building perspective. The chapters offer valuable insights into the challenges and opportunities associated with implementing a policy that embraces diversity while fostering national integration.

We also explore the potential impact of the National Education Policy 2020 on higher education, vocational training, skill development, and the crucial linkages between academia and industry. By examining these dimensions, we seek to identify pathways for nurturing an educated and skilled workforce that can drive economic growth and social development. This book is a testament to the collective effort of the contributors, whose expertise and commitment to education have shaped its content. We extend our deepest appreciation to these scholars, researchers, policymakers, and educators for their invaluable insights and contributions.

Finally, we express our gratitude to the readers who embark on this intellectual journey with us. By engaging with the ideas and perspectives presented within these pages, you play an integral role in realising the transformative potential of the National Education Policy 2020. Your active participation, dialogue, and constructive critique are vital in the process of nation-building through education.

As we embark on this exploration of the National Education Policy-2020, let us remember that education is not merely a means to an end but a powerful force that can shape the destiny of nations. Together, let us embrace this opportunity to build an inclusive, progressive, and vibrant India.

- Editors

FORWARD

On the path of progress

Welcome to "National Education Policy-2020: Nation Building Perspectives." In this thought-provoking and inspiring collection, we embark on a captivating journey into the realms of NEP-2020 from a nation building perspective. The world around us is evolving at an unprecedented pace, and it is our collective responsibility to comprehend and navigate the complex challenges and opportunities that lie ahead. In this regard, NEP-2020 brings drastic reforms in education of the country to meet the global standard and Indian values. NEP-2020's approach to education is holistic, focusing on the development of the whole person. It is based on the belief that education should help young minds to develop their physical, emotional, and mental capabilities.

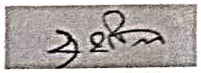
This edited book brings together a diverse group of renowned thinkers, experts, and visionaries from various fields, each offering their unique insights and perspectives on the transformations reshaping education with reference to NEP-2020 from national building perspectives. As you delve into the chapters that follow, you will encounter an eclectic blend of ideas, research, and personal anecdotes that explore a wide array of topics related to NEP-2020. Moreover, this collection encourages us to think beyond the conventional boundaries of our disciplines and to embrace interdisciplinary collaboration. The interconnectedness of today's challenges demands a holistic approach, and by drawing insights from multiple domains, we can unlock new perspectives and innovative solutions to shape a brighter future. While the chapters within this book may present differing viewpoints, they all share a common thread: a belief in our collective agency to drive positive change. It is our hope that by engaging with these

ideas, you will be inspired to contribute your own unique perspectives and play an active role in shaping the future.

We would like to express our sincere gratitude to the contributing authors whose expertise and passion have made this book possible. Their dedication to knowledge, progress, and the pursuit of a better world is truly commendable. We would also like to thank the readers who have chosen to accompany us on this intellectual expedition. Your curiosity and engagement are fundamental to the transformative power of these pages.

As we embark on this enlightening journey, let us embrace the uncertainties, embrace the challenges, and embrace the opportunities that lie ahead. Together, we can forge a path towards a future that is inclusive, sustainable, and prosperous for all.

Enjoy the voyage.



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CYBERNETICS

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Introduction

In this present scenario, technology is the application of knowledge for achieving practical goals in a reproducible way. A term 'Cybernetics' is also relates to the science of technology which concerned with circular casual and feedback mechanisms in biological and social systems. Cybernetics is associated with models in which a monitor compares what is happening to a system at various sampling times with some standard of what should be happening and a controller adjusts the system's behavior accordingly. It is a self-regulating automatic system that can modify its operation in the light of the feedback received by it through its output. It is the feedback mechanism that is responsible for running a system in a proper way and providing clues for bringing desirable improvement in it for the effective realization of the objectives. The Cybernetics theory and mechanism can be properly applied in the development of appropriate instructional designs for turning the usual system of instruction into a cybernetics system. This chapter deals with the importance of cybernetics and their mechanism in the design of instructional process.

Keywords : Cybernetics, Instructional Designs, Teaching-learning, Steersman

Meaning of Cybernetics

In the first half of the 19th century, the French physicist Andre-Marie-Ampere, in his classification of the sciences, suggested that the still nonexistence science of the control of government be called Cybernetics. The term was soon forgotten, however, and it was not used again until the American mathematician Norbert Weiner published his book Cybernetics in 1948. In that book Weiner made reference to an 1868 article by the British Physicist James Clerk Maxwell on governors and pointed out that the term governor is derived, via Latin, from the same Greek word that give rise to cybernetics. The date of Wiener's publication is generally accepted as making the birth of cybernetics as an independent science.

Weiner defined Cybernetics as "the science of control and communication in the animal and machine". This definition relates cybernetics closely with the theory of automatic control and also with physiology, particularly the physiology of the nervous system. For instance, a "controller" might be the human brain, which might receive signals from the monitor (the eyes) regarding the distance between a reaching hand and an object to be picked up. The information sent by the monitor to the controller is called feedback and on the basis of this feedback the controller might issue instructions to bring the observed behavior (the reach of the hand) close to the desired behavior (the picking up of the object). Indeed, some of the earliest work done in Cybernetics was the study of control rules by which human action takes place, with the goal of constructing artificial limbs that could be tied in with the brain.

The Cybernetics approach may prove very useful in developing appropriate instructional designs quite self-regulatory and auto-instructional in their execution by properly adopting the mechanism of feedback. The term Cybernetics has been derived from the Greek word Kubernetes meaning Steersman. The role of steersman is to steer the ship or boat in a right way in a right

decision. This means that the person should have proper control over the steering function. When he gets a hint or communication (feedback) that the boat or ship is going astray, he should exercise control and steer the vehicle again in the right direction. In this way, by regulating corrective device and appropriate control with the help of good communication and timely feedback, the steersman is able to regulate the working of his vehicle.

In the similar way, the teacher is the steersman of the teaching learning process. He has to take along with him the person for reaching a set goal by steering out a learning path. For this purpose, the instructional system he chooses must be controlled and regulated. While working with system, if he gets feedback that the system is working properly and gives output, it will be steered with no change. But if he gets communication that there is something wrong with the system, he will try to set it right. For this purpose, he may have to bring changes in his own method of teaching, the size and quality of the content or learning experiences, interaction with his students etc and again the system is put to work after being corrected. This is how a system is controlled by receiving proper communication and feedback about its functioning in right or wrong way.

Cybernetics is the study of human/machine interaction guided by the principle that numerous different types of systems can be studied according to principles of feedback, control and communication. It brings automatic modification in our own behavior and body system as a result of the process of sensory feedback. When we detect bad and good smell in the air, the sensory feedback makes us bring changes in our body system for avoiding or receiving the air as much as possible. Under this mechanism our body system constantly works towards maintain a normal state of balance between input and output. The mechanism of homeostasis pertaining to the physiological and biological system also brings into limelight the process of automatic self-

regulatory control. For example, when the blood sugar level drops in our body, the brain, glands, stomach and other organs of the body send out signals (feedback) which activate a hunger drive or hunger motive and makes us hungry. After food has been consumed, our body returns to a state of equilibrium.

Cybernetics is a developing science and technology which aims to help in the building of such a system which is self-regulatory. It may be defined can helped as the science of communication and control that can help in building as a self-regulatory automatic feedback system similar to that found in animal, men and machines.

In subsequent years the computer and the areas of mathematics related to it (e.g. mathematical logic) had a great influence on the development of cybernetics-for the simple reason that computers can be used not only for automatic calculation but also for all conversions of information, include the various types of information processing used in control systems. This enhanced ability of computers has made possible two different views of cybernetics. The narrower view, common in western countries, defines cybernetics as the science of the control of complex system of various types- technical, biological and social. In many western countries particular emphasis is given to aspects of cybernetics used in the generation of control system in technology and in living organisms. A broader view of cybernetics arose in Russia and the other soviet republics and prevailed there for many years. In this broader definition, cybernetics includes not only the science of control but all forms of information processing as well. In broader definition, cybernetics includes not only the science of control but all forms of information processing as well. In this way, computer science, considered a separate discipline in the west, is included as one of the components part of cybernetics.

Definition of Cybernetics

Cybernetics defined as control and communication in the animal and the machine.

Norbert Weiner

Cybernetics was understood as the study of "circular casual and feedback mechanism in biological and social systems".

Macy

The role of Cybernetics as a form of cross-disciplinary thought which made it possible for members of many disciplines to communicate with each other easily in a language which all could understand.

Margaret Mead

The art of governing or the science of government.

Andre-Marie Ampere

The study of systems of any nature which are capable of receiving, storing and processing information so as to use it for control.

Andrey Kolmogorav

Theory and Mechanism

Cybernetics defined stands for the science of communication and control. It refers to a self-regulatory automatic system operating in animals, men and machine. The principle can be equally applied on the field of education by taking education or instruction as a system. The main theoretical ideas and principles of cybernetics are outlined now:

1. **Any system has three basic elements – input, process and output.**

The system needs something in the shape of men and material resources for its initial functioning. It is the input. The

process unit that works for modifying the input and output is the unit for discharging the results of the process.

2. **The system can be classified as an open loop system and a closed loop system.**

The open loop system is not a self-corrective automatic system because it is not able to communicate and provide feedback about its working. But the cybernetic system stands for the closed loop system, in which the output from a system can be effectively returned as input for controlling the future output. It is referred as feedback. It is the communication machinery that alerts the system for adopting self-corrective device, control its working and making further necessary improvement in its functioning.

3. **The feedback mechanism in a cybernetic system.**

The three main functions which are responsible for the feedback as stated by Smith and Smith (1966) are as:

i. Generating actions of the system towards a goal.
ii. Comparing the effect of this action with the most appropriate way and detecting deficiencies/errors to meet the goals.
iii. Utilizing the deficiencies/errors signals to redirect the system.

In this way, it is the feedback mechanism that is responsible for running a system in a proper way and providing clues for bringing desirable improvement in it fr the effective realization of the objectives.

Use in the development of Instructional Designs

The Cybernetics theory and mechanism can be properly applied to the process of instruction for making it a self-regulatory, self-corrective and auto-instructional system. Let us see some key points of Cybernetics:

- Ordinarily, the teaching or instruction as a system may be supposed to have three major elements-input, process and output.
- The inputs elements of the instructional system here will consist of the learning experiences (in the shape of curriculum, syllabus, etc.) to be given to the students, their needs and entry behavior, the objective of teaching, the teacher, the instructional methods, the material and the material resources and the teaching-learning environment.
- In process part, the actual instructional work will be carried out by involving a making use of the input material- human and physical.
- The output part of the teaching or instructional system will bring the outcomes of the instructional process in the form of the students' responses, their gain in knowledge, acquisition of skills, change in attitude and interest etc.
- For turning the usual system of instruction into a cybernetics system, the main role is to be played by feedback mechanism. The output of the instructional process should properly return as input to control future output. It will be automatically work as self-corrective device for detecting the strengths and weaknesses of the input element and also of the process part. After making needed correction and processing it afresh, it will bring improved results in the form of better output which in turn will provide fresh incentive and good feedback for the better functioning of the instructional system. Gradually, the system will yield into a self- regulatory auto-instructional system.

For the development of cybernetics instructional design the learning material in the Keller plan is divided into units. Each unit is quite comprehensive and meaningful to be completed in a week's duration. The course included in the unit consists of :

1. The teacher generating reading material
2. A study guide with an approach plan based on stated behavioral objectives.
3. Four sets of evaluation material (equivalent in terms of testing and difficulty levels).

In the instructional process, the students go through the reading material with own pace. They are required to read the instructional objectives carefully. They can take the help of the study guide for their independent pursuit. The study guide may suggest them original texts, articles, sources etc for their self-instructional activities. After going through a unit, they have to be evaluated. On their request, they are to be given randomly one of the four tests. The results of the test are transferred to them by the concerned tutor. The output works as input in the form of proper feedback for bringing self-correction and improvement to the individual learner. It is a self-paced auto-instructional plan that leads to mastery learning by independent efforts.

Application and Advantages in Education

Cybernetics is defined as a science of communication and control. There are many advantages while using Cybernetics. These are:

a) The teaching and instructional process can be made self-regulatory and auto-instructional by properly adopting the mechanism of feedback as advocated by cybernetics. If we can arrange for the continuous flow of the feedback in the input element of the instructional system, it can reinforce the learner's behavior for becoming an independent and autonomous one.
b) The basic and central problem in any course of teaching-learning is the proper motivation. However, if we adopt the cybernetics approach, the regular feedback automatically

received by the leaner may continuously reinforce him for getting due motivation and zeal for self-learning.

c) There can be proper control over the system of instruction as a whole with the application of the principles of cybernetics. With the adoption of this approach, the teacher can exercise full control over their teaching and the learners over their learning for the realization of the set objectives.

d) Cybernetics may be used for developing remedial instructional activities. The feedback provides information about the deficiencies and shortcomings creeping into the system. On the basis of such detection, a proper remedial programme may be chalked out by means of measuring the improvement in output and subsequent feedback.

e) Cybernetics is an automatic feedback system applied to the process of teaching and learning to help the teachers and the learners in their self-improvements.

f) Cybernetics as a method of good communication and control can assume the role proper training technology. The cybernetics approach with its tool of controlled feedback has been able to give birth to a number of good innovations in the field of teacher education such as micro-teaching, simulated teaching and interaction analysis. Accordingly, it can be properly utilized for bringing desirable modifications in the behavior of teacher trainees and helping them learn appropriate teaching skills.

g) The Cybernetics technique leads to proper individualization of the instruction. Every learner may learn the thing with his own pace. He gets opportunity for self-correction with the help of dynamic feedback. Such individualized auto-instruction has provided the way for proper development of self-instructional material in the form of printed programmed text and audio and video programmes for spreading the programmes of distance education.

Conclusion

Cybernetics may be termed as science of communication and control that can help in building a self-regulatory automatic feedback system similar to that found in animals, men and machines such as refrigerator, washing machine, iron, heater and playing devices etc. The Cybernetics system stands for the closed loop system. In closed loop system the output from the system can be effectively returned as input for controlling future output. It is referred as feedback. This type of effective and dynamic feedback available only in the closed loop system is the centre nerve of the cybernetics approach

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