

Modernising India's Knowledge System: a Framework for Strategic Planning via Experimentation

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Abstract

The best way to preserve and transmit the rich heritage of Indian knowledge to the youth of our modern period is through educational opportunities. An overview of the Teacher-Disciple Tradition and the Bhartiye Gyan Prampara (Indian Knowledge Tradition) was provided at the outset of this research study. Following this introduction, the article delves into a structural study and conceptual framework of India's technical and professional education system. Among the many topics covered in this comprehensive guide to holistic education are its theoretical underpinnings, its connections to traditional Indian wisdom, and the state of education in the current world. Prioritising a middle ground between traditional knowledge and modern teaching methods is one of the requirements. As an example of how ancient wisdom and modern teaching methods can coexist, consider the focus on holistic education approaches that help to strengthen the Indian Knowledge Tradition. Consequently, the deeply held belief in India is vigorously advocated. 'Ingrained in India' is one of the most significant ideas that emerged from India's New Education Policy of 2020 and will play a crucial role in the country's future educational system. In order to ensure that all students have access to an inclusive, diverse, and culturally rich educational experience, this idea is interwoven throughout the NEP. The term stands for an approach to teaching

that has deep roots in India's rich intellectual, historical, cultural, and spiritual heritage.

Keywords: Indian Knowledge Tradition, Teacher-Disciple Heritage, Professional/technical education, NEP 2020, Comprehensive Learning

I. INTRODUCTION

A person is most prepared to assist the community when s/he has a holistic education. Additionally, it fosters personal growth in a variety of areas, such as the physical, mental, spiritual, moral, and creative aspects of our being. The holistic education method, which was the mainstay of our country's classical schooling system, placed equal value on learning by heart and on developing students' capacities for original thought and analysis. Throughout history, from elementary school all the way up to college, education has been closely tied to the promotion of real-world application of knowledge. Learning has long been linked to this, as they centre on concepts like dharma (responsibility), karma (action), and the pursuit of knowledge as a means to attain self-realisation. Ethical and moral considerations in the classroom are steered by these ideas. A lot of thought and preparation went into the educational heritage, curriculum's treatment and structural design of Indian tradition and culture, which played an important role in the comprehensive charter of New Education Policy (NEP) 2020. A well-organised strategy for incorporating the Indian Knowledge System into today's educational system is necessary, with a focus on holistic teaching methods integrated into the curriculum at all grade levels.

Research objectives

1. To understand intellect trend analysis of Indian knowledge System.
2. To explore opportunities and challenges impacting Indian knowledge system, specifically Professional/technical education.
3. To take an evaluative look at various strategic advancements and conceptual applications in Indian Knowledge System.
4. To inspect pragmatism of NEP 2020 being applied in traditional and modern Indian Education System.

Research methodology

This study is qualitative and exploratory cum descriptive in nature. Facts have been gathered from a broad array of conceptual and empirical literature review and in- person and non-person semi structure discussion with academicians and students in the institutions, especially in Bihar.

Discussion

The ‘Teacher-Disciple Tradition/Heritage’ (Guru-Shishya Parampara) in relation to technical instructors as professionals

The traditional value systems and dynamics between educators and learners have substantially eroded due to the proliferation of information and technology and the pervasive influence of the digital realm in all facets of life. The time has arrived to revive these connections and determine how to restore the ‘Guru-Shishya Parampara’ and its beneficial value system from the verge of extinction. The system delineates the level of professionalism anticipated from a ‘Guru’ (teacher or trainer) and the level of respect and civility owed to a ‘Shishya’ (disciple or trainee). When a ‘Shishya’ approaches him, the Guru’s demeanour should convey his benevolence and commitment to fulfil their needs. Undoubtedly, society acknowledges and appreciates teachers for their professional achievements. We can use the fundamental concepts underlie this broad based concept outline below.

Guru-Shishya Parampara

The foundation of traditional Indian education and practices is the ‘Guru-Shishya Parampara’ (Teacher-Disciple tradition). A Shishya is referred to as ‘a student of a Guru in Sanskrit. Parampara denotes a ‘continuous succession’ or tradition. The tradition involves the transmission of wisdom from one generation of Gurus to the next through oral communication. The ‘Shishya’ resides with his Guru in the Gurukul, receiving a comprehensive education akin to that of a family member. A ‘Guru’ is an eloquent, esteemed authority in a specific trade who possesses intelligence and charisma. Regardless of whether he is an expert in the arts, philosophy, or religion, or only an educator, he may provide wisdom and guidance to anyone. It is the Guru’s duty to cultivate a robust Guru-Shishya relationship and facilitate the progress of his followers. The ‘Shishya’ must demonstrate his worthiness of the Guru’s teachings by submission. The Guru-Shishya Parampara has several characteristics:

- a) An educational relationship is established between the instructor and the student. Its prerequisites mutual faith with the Guru, recognising the significance of a holistic education from both the Shishya's and Guru's perspectives.
- b) This is not an informal arrangement; instead, it is publicly instituted by the community during the initiation process, when the Guru officially accepts the 'Shishya' and assumes the position of guide and mentor, assisting the new 'Shishya' in achieving full maturity.
- c) In most instances, the ‘Shishya’ would spend entire days in the ‘Gurukul’ residing with the Guru. Defining the identity or ‘School of Thought’ of that Gurukul necessitated unique teachings from the Guru. As a dedicated disciple of his Guru, the ‘Shishya’ was required to meticulously heed all

that his 'Guru' conveyed. The 'Upanishads' signifying 'to sit near and listen' are unique passages that the knowledge was to be internalised by the students and subsequently documented in a concise and systematic manner.

- d) A fundamental tenet of the Gurukul philosophy is experiential learning. The principal methods employed to convey knowledge comprised problem-solving and inquiry-based instruction. At Gurukul, educational excursions were a frequent occurrence.
- e) Participation of intellectual conversations and dialogues to confer with diverse schools of thought or Gurus.
- f) In the term 'Guru-dakshina' the 'Shishya' presents a gift to the Guru as a token of gratitude, which may be financial or a display of a skill imparted by the Guru.

A Triadic Framework for Comprehensive Learning

It is customary for the Guru to reside with the 'Shishya' or disciple. The student must demonstrate commitment to the instructor and adhere to their directives as a fundamental aspect of the partnership. The learner's continuous physical interaction with the Guru fully engages the three dimensions of learning- spiritual, intellectual, and emotional- in the conveyance of knowledge from teacher to student. Perceiving the Guru in this manner enables the disciple to comprehend the Guru more profoundly and emulate his or her path. Traditionally, the authority of the Guru may vary. However, once Gurukuls became obsolete and contemporary educational institutions developed, this form of instruction effectively ceased to exist. Upon understanding this concept, one may contemplate integrating these commendable concepts into the existing educational framework, especially within the technical and vocational education system.

The Guru-Shishya tradition in the contemporary context of technical education

Individuals must consistently strive to be learners or followers for this concept to materialise. In accordance with the T.J. Watson, head of IBM Corporation, asserted, 'There is no saturation point in education' (https://en.m.wikipedia.org/wiki/Thomas_J._Watson). It is essential for both educators and students to cultivate an open mind and a desire for knowledge throughout their careers. Currently, due to the expansion of digital and information technology, the ubiquity of smart mobile phones among students and educators, and the plethora of publicly accessible mobile applications, the situation is significantly more manageable than it was four decades ago. The conventional transfer of knowledge and skill necessitated close physical proximity between the Guru and the Shishya. In contemporary times, with appropriate design, this ideology could materialise. Particularly in the Internet era, the one-to-one contact can still be preserved to attain the necessary skills. The teacher, as a facilitator,

might guide students instead of providing them with information directly. Some educators may already be implementing it to some extent. Nevertheless, the time has arrived for all educators to adopt contemporary technologies. The dissemination of the existing technical teachers' roles and responsibilities at the earliest opportunity would be highly appreciated. All technical and professional instructors must possess a comprehensive awareness of current market demands. The term 'industry' encompasses any enterprise within the community or corporate sector, whether wage-employed or self-employed, that facilitates the earning of one's livelihood (Earnest, 2016)

(<https://obamawhitehouse.archives.gov/the-press-office/2016/03/04/press-briefing-press-secretary-josh-earnest-342016>). This can be accomplished by fostering robust relationships with them through effective liaison activities. Commencing with a visit and multiple brief internships in the company may facilitate the resolution of both significant and little challenges within the sector. As an educator, it is one's duty to facilitate one's students' development in four domains:

- a) Acquisitive, denoting the capacity to assimilate new knowledge and utilise existing understanding; 'learns to learn'.
- b) Adaptive, signifying the capacity to evolve with changing circumstances to achieve success in the various different positions, responsibilities, and projects required as one progresses in one's career.
- c) Innovative, signifying the ability to effect enhancements in the processes and/or goods with which one engages, regardless of whether such alterations are micro, small, or considerable.

In the present context of technical education, the Guru-Shishya Parampara could be implemented if the previously mentioned activities are earnestly pursued in both principle and practice, and if educators actively engage in instructional delivery (their primary responsibility) as well as in the strategic formulation of lesson plans and curricula that promote student involvement. This is a fundamental component in NEP 2020 too.

Initiatives to Familiarise Students with Content Analysis- A Strategic Approach

Upon completion of the curriculum and content analyses, trainers and educators can comprehensively grasp the subject matter, interrelationships, and dependencies via the application of a spray diagram or concept map. Students must understand that the course outcomes, encompassing cognitive, psychomotor, and affective domains, constitute the objective of the educational experiences. To effectively foster these skills, one must integrate a variety of instructional tactics and approaches relevant to the topic being taught. It is noteworthy that numerous educators have substantial subject-matter expertise; but, when conveying this

knowledge to their students, they often only present the facts without considering optimal teaching methods. Consequently, despite the teacher's extensive knowledge, the student remains disinterested and unmotivated in class. Consequently, as an educator, one's instructional methods are equally significant as the subject matter one addresses. In this lesson, it is essential to define 'teaching (instructional) method (or technique)' and 'teaching (instructional) strategy'. Additionally, it is crucial to examine the appropriate selection of these terms to achieve learning objectives across many domains.

Educational Approaches

Teaching methods, instructional methods, and instructional techniques are employed interchangeably in effective instructional design research. A teaching style is defined as a teacher's 'arrangement of learning events adopted to facilitate learning in students' (Banthiya, 1999). Technical schools frequently employ diverse instructional styles, including but not limited to lecture, tutorial, demonstration, laboratory, project, and seminar.

Employing a multifaceted strategy is prevalent in the educational process. A teaching approach is more suitable than a teaching method in this circumstance. The term 'strategy' is derived from the military, signifying 'the science and art of planning' and orchestrating significant operations for military manoeuvres in a campaign to achieve a defined objective. Organising and overseeing various educational activities to fulfil the objectives of the session is also necessary in other environments, such as the classroom. Teaching strategy is defined as 'the science and art of arranging and guiding the utilisation of teaching-learning events to achieve results through suitable teaching method(s)' (Banthiya, 1999). To ensure efficient learning, it is essential to align the subject matter with the most efficacious teaching approaches. Research in educational technology indicates the necessity of diverse instructional techniques. The subsequent scientific facts substantiate this assertion:

- a) The senses of hearing, sight, taste, touch, and smell will collectively boost the learning process. Most learning situations can be enhanced by engaging at least two senses, specifically auditory and visual modalities. Additionally, numerous managerial and engineering situations can benefit from tactile interaction.
- b) A learner's effective attention span is considered to be between fifteen and twenty minutes. The integration of diverse teaching approaches improves learning by adding variety, alleviating monotony, and offering stimulus diversity.
- c) Learners have diverse learning methods due to their unique peculiarities. Instructional tactics should align with students' preferred learning modalities to the greatest extent possible.

- d) As indicated below, several cognitive processes, physiological functions, and educational contexts are essential for attaining learning objectives across multiple domains:
- e) Metacognitive skills, along with factual, conceptual, procedural, and application-level information, as well as analysis, evaluation, and creation-level knowledge, constitute the cognitive learning outcomes.
- f) The capacity to execute physical manipulative tasks exemplifies a psychomotor learning outcome.
- g) Attitudes, interests, values, and motivating activities serve as tactics for achieving emotional learning outcomes.

Therefore, it is essential to modify instructional strategies across different fields to attain the intended learning outcomes.

Methods for Teaching Varied Disciplines

The proverb states, ‘Theory without practice is sterile; practice without theory is blind’, indicating that effective learning necessitates both knowledge and application. Achieving a balance among subject matter expertise (the ‘know part’), pedagogical rigour (the ‘do part’), and student accomplishment is crucial for every educator.

Techniques for Educating Students on Factual Information

Facts serve as the basis for both conceptual and procedural knowledge. Accurate information includes both generalised facts and specific details. The foundation is firmly established with a precise understanding of factual facts related to many subjects. These are essential to any discipline and are requisite for conducting research, analysis, and problem-solving. Commit to memory frequently utilised facts and refer to books or other resources for less often used information. The memorisation of factual knowledge enhances both accuracy and speed. Students who memorise the value of ‘n’ and their multiplication tables are more likely to solve numerical or mathematical problems with ease.

To convey factual knowledge, a combination of lectures, in-class and laboratory demonstrations, as well as industry and field visits may be beneficial. These methods are effective for conveying factual information; however, alternative approaches exist such as:

- a) Mnemonics facilitate memorisation. The mnemonic VIBGYOR (Violet, Indigo, Blue, Green, Yellow, Orange, and Red) serves to memorise the names of the colours in the spectrum, much to a rainbow.
- b) Highlight concepts that are readily memorable, such as patterns or associations.
- c) Utilise charts and visual representations that are appropriately marked with text and colour.

- d) Incorporate a glossary of terms, acronyms, and tables for reference, along with a readily accessible list that includes formulae, equations, and similar items.
- e) Utilise analogies when presenting unknown topics such as heat, voltage, and current.
- f) Illustrate a concept using examples and non-examples to enhance comprehension. Consider 'fish' as a case in point. It refers to jawless, ectothermic creatures that reside in aquatic environments and feature fins, permanent gills, and scales. Small fish, large fish, and fish with atypical shapes are all examples of the diverse varieties of fish. 'Dolphin' serves as the counterexample in this context. The dolphin is a warm-blooded mammal that utilises its lungs for respiration.

Strategies for Mentoring Students in Conceptual Comprehension

For a larger structure to function well, it is essential to possess conceptual understanding of the interrelations among its components. To illustrate the scope, one must understand theories, models, structures, generalisations, and principles (Anderson & Krathwohl, 2001). The concept possesses distinct attributes and is essential. Conceptual knowledge encompasses all anticipated competencies of a student, including the capacity to differentiate and draw comparisons among various types within the same category. Conceptual knowledge encompasses theories, laws, and principles. Educators must utilise their imaginations while conveying abstract concepts to students. Students must possess a comprehensive understanding of this, as it is essential to all disciplines. The issue resides in maintaining student engagement during the learning process, enabling them to apply their acquired knowledge to real-world challenges. Knowledge can be conveyed through either direct (deductive) or indirect (inductive) instructional approaches. Deductive teaching approaches commence with rules or principles and proceed to deduce consequences or subsequent occurrences. This type of training is prevalent in universities, particularly in engineering and mathematics courses. Utilising this approach allows for the extensive coverage of topics in a brief timeframe through straightforward presentations of derivations and lectures. Students might gain advantages from inductive learning methods since they enable them to observe and infer fundamental ideas (Hesket, Farrell, and Slater, 2003).

One may employ the following strategies based on the sort of conceptual knowledge, which can be classed, categorised, principled, theoretical and modelled:

- (a) Employing a systematic approach, articulate the notion, elucidate its meaning, and propose scenarios in which it may be used. Ensure the inclusion of assumptions, constraints, examples, and non-examples (deductive approach)

- (b) Employ an inductive approach by orchestrating a systematic observation of a pertinent occurrence and include probing enquiries to guide student cognition towards inferring the relationship that substantiates the phenomenon's existence.
- (c) Utilise examples, practical activities, laboratory experiments, and classroom discussions to elucidate and clarify concepts.
- (d) Promote the practice of maintaining reflecting journals, blogs, and graphic organisers.

Techniques for Educating on Protocols

The primary focus of procedural knowledge is on methods of inquiry, criteria for algorithm application, techniques, and processes (Anderson & Krathwohl, 2001). This encompasses both psychomotor and cognitive ability. The focus here is on adhering to either a sequential or non-sequential series of steps, contingent upon the task at hand. Establishing equipment requires psychomotor abilities, unlike the sequential cognitive processes needed for differentiation and integration. If pupils acquire a talent without comprehending the underlying concepts, principles, and rules, they may ultimately possess inconsequential information. Certain students may possess a robust understanding of solving linear and quadratic equations; yet, they may lack the essential knowledge necessary to comprehend the distinctions between these problem types and their appropriate applications. When conveying procedural knowledge, educators must consider the following:

- (a) Render the requisite procedures transparent. This may be depicted visually, articulated in writing, or both.
- (b) Develop a student handbook containing a checklist of tasks to facilitate easy reference to processes for students.
- (c) Demonstrate the procedure sequentially, ensuring to highlight critical elements.
- (d) Allow the pupils to practise implementing the processes.
- (e) Provide input immediately.
- (f) Utilise video programs and simulations whenever possible.

Approaches for Teaching Students Metacognitive Skills

Metacognitive knowledge refers to the capacity to comprehend and regulate one's cognitive processes (Anderson & Krathwohl, 2001). Students' self-awareness, or metacognition, includes their comprehension of their own knowledge and their capacity to manage their learning, which refers to the management of cognition. Dorian, Mevarech, and Baker (2018) assert that to manage cognition, it is essential to organise, monitor, and assess the learning process. The subsequent content is a summary of these and can be listed as:

- (a) To achieve objectives, it is essential to strategise by defining them, assessing present knowledge and skills, estimating the required time, and enumerating any additional resources or actions that would be vital.
- (b) Self-assessment in regard to the plan constitutes a component of monitoring. By monitoring progress, individuals can guide their own learning and modify schedules, resources, and activities as necessary to achieve their goals.
- (c) Reflecting on their classmates' perceptions is an effective method for pupils to evaluate their own learning progress. Studies reveal that individuals, upon repeating the same learning experience, may reassess their strategies and contemplate other planning methods.

Metacognitive knowledge growth may be essential in diverse contexts, including the classroom, laboratory, project work, and the resolution of real-life problems. Consider these aspects to foster metacognition.

- i. Students may be provided with several methodologies for learning activities that are directly pertinent to their course content.
- ii. Students are advised to communicate their thought processes and strategies for the assignment to their peers and instructor using visual aids such as concept maps, flow diagrams, and spray diagrams. The general framework may be determined by either the students or the teacher.
- iii. Encouraging students to articulate their preliminary goals, methodologies, determined actions to tackle the issue, reflections and assessments of the outcomes, and recommendations for enhancement is crucial for meaningful involvement.
- iv. Direct students to utilise rubrics for self-assessment.
- v. Students will enhance their ability for independent thought as they understand their learning processes and utilise these tactics to efficiently assimilate new information.

Methods for Teaching Psychomotor Skills

Proficiency in the operation of machinery, tools, and other implements is crucial for individuals in the professional field. Instructing practical skills necessitates meticulous care to get superior outcomes. Students in today's technologically advanced society have numerous possibilities to gain practical skills. Virtual laboratory resources and simulations, together with assistance choices, pertinent YouTube videos, and more materials, are readily accessible. They can access these at their convenience, rendering it a 'quick fix' solution. Despite the abundance of high-quality videos on YouTube, it does not imply that individuals are effectively acquiring skills. Consequently, it is the educator's responsibility to notify the class in advance regarding:

- (a) The precision of related mental and factual comprehension,
- (b) Crucial measures to implement, and
- (c) Crucial considerations when developing abilities to ensure a superior outcome.
- (d) Miller's Pyramid (Allery, 2009) serves as an effective instrument for educators to ascertain the best suitable instructional methods for a specific skill. The students' progress from the foundational level as they attain new practical abilities. From the foundational level of education to the culminating performance, it is the teacher's duty to guarantee that the student comprehends the pertinent factual and conceptual knowledge. To enhance the instruction of pupils in practical skills, consider the following:
 - Enhance student awareness of factual information related to practical skills, such as the operation of a microscope. Identify the distinct components of the microscope, assign appropriate nomenclature to each component, and elucidate the terminology employed (including focus, lens type, and focal length).
 - Allocate time to elucidate the operational principle and the function of each component.
 - Provide an example of the procedure for setting up a gadget.
 - Allow them to practise the steps with the teacher's guidance progressively.
 - Indicate to students the areas requiring modifications at an alternative level in their feedback.
 - Ensure they have the opportunity to demonstrate their full capabilities. Provide your reflections subsequent to the presentation.
 - Implement a systematic decrease in assistance to enable students to develop independent skills.
 - Provide an opportunity to refine skills that will result in precision and accuracy.
 - Highlight the need of safety protocols, including the utilisation of fire extinguishers and analogous devices, alongside the necessity of effective housekeeping and cleanliness.

Methods for Teaching Affective Skills

An effective educator consistently endeavours to cultivate emotional dimensions in their students, encompassing empathy, compassion, motivation, enthusiasm, a sense of belonging to the task, peers, and community, along with sentiments of preference, aversion, and interest, by amalgamating affective domain outcomes with cognitive and psychomotor domains. The affective component of learning is essential for acquiring and enhancing outcomes in the cognitive and psychomotor domains. Emotional elements, including adherence to teacher

directives, consistent class attendance, timely submission of assignments, management of negative emotions such as anger, self-motivation and encouragement of peers, and appreciation of diverse viewpoints, are revealed through teachers' critical observation of students' behaviours and responses in the classroom and laboratory settings. Accomplishing this requires rigorous preparation of sessions and activities. A teacher can incorporate the affective dimension of learning by adhering to these rules:

- a) Develop policies and practices in the laboratory and classroom that address the emotional needs of students.
- b) Emphasise the significance of pupils adhering to processes and standards, including timely submission of assignments, punctuality, and upholding professional ethics.
- c) Allow them opportunities to develop as independent critical thinkers and problem solvers.
- d) Provide individuals opportunities to assume leadership roles, contribute meaningfully to teams, engage in conversations, volunteer for tasks, and write for campus publications and bulletin boards.
- e) Facilitate and conduct role-playing events.
- f) Incorporate emotional learning elements into rubric design and ensure students are cognisant of them.

Above discussion offers a comprehensive examination of techniques for conveying factual, conceptual, procedural, metacognitive, psychomotor, and affective information in relation to content analysis. An educator may leverage this to their benefit when executing lesson plans. Achieving a balance among lesson plan objectives, student learning outcomes, and course content is crucial for all educators.

It is insufficient to be called as "Vishwaguru", on the basis of merely recount our pioneering efforts across various fields. Only longevity of our culture does not imply its perfection. Achieving greatness requires robust foundational ideas, rigorous methodologies for framework development, innovative epistemologies, and high-quality institutions. We must move beyond our complaints regarding the three-month duration required to burn the books at Nalanda and focus on the preservation of the one crore manuscripts that remain. These manuscripts serve not only as historical artefacts but also as relevant subjects of study (Chaudhary, 2023). A holistic and multidisciplinary education aims to develop all human capacities in an integrated manner, as outlined in NEP 2020 (Roy, 2022). This encompasses intellectual, aesthetic, social, physical, emotional, and moral capacities. The government of India implemented the Indian Knowledge System to standardise education nationwide. This initiative seeks to preserve cultural heritage while also promoting the comprehensive development of children. The objectives of revitalising the Indian Knowledge System can be

achieved by integrating holistic educational approaches with contemporary teaching methodologies. The current period presents significant opportunities; however, all individuals involved in the organised education system bear the responsibility to transform this obligation into viable possibilities. To address the significant influence of Western culture on society and the colonised mentality it engenders, it is essential for children to be exposed to Indian culture, heritage, and civilisation from a young age. Indian universities that promote holistic and multidisciplinary education, exemplified by Takshashila and Nalanda, have a historical precedent of integrating diverse disciplines into their curricula (Roy, 2022). India ranks highest in overall levels of knowledge. Swami Vivekananda (1970) posits that education represents the manifestation of the inherent perfection within individuals. It allows individuals to access their own knowledge and wisdom, thereby enhancing their moral, spiritual, and intellectual capacities. The ability to assimilate the knowledge transmitted from our great-grandparents is integral to this process.

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