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HIGHER EDUCATION IN INDIA
VISION, PURPOSE, POLICY AND STRATEGY

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HIGHER EDUCATION IN INDIA
VISION, PURPOSE, POLICY AND STRATEGY

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This chapter attempts to redefine the vision, purpose, goals, means, and expected outcomes of higher education aligned to our history, culture, and aspirations, as articulated in the National Education Policy – 2020, and outlines the strategies to be adopted during its implementation to meet our national needs and the global good. We spell out the relation between a vision of the future of India, and educating the young minds as a means to achieve that vision in the next thirty years. The vision and its actualisation need to be aligned to the purpose of education from Kindergarten to PhD. Central to this enterprise is the concept of a Programme Syllabus as distinct from a subject-wise syllabus and a year-wise syllabus. The Programme Syllabus lays out the understanding, abilities, habits of thought and attitudes expected to be imbibed by students. We need to produce learning materials, and supplementary teaching resources, as well as sample assessment tasks to probe into the learning outcomes we aim at. Our primary focus is on Higher Order Cognitive Capacities as mentioned in the National Education Policy-2020. The chapter outlines a model syllabus for General Education as a strand that runs from school to PhD in all types of education. We recommend a National Think Tank to actualize this vision by 2040.

INTRODUCTION

The principles of access, equity, employability and quality have been central to India's education policies and recommendations since the Kothari Commission Report in 1966 and the first National Education Policy in 1968. Now, looking at this history, we see that even though some progress with respect to access and equity has been achieved, our progress in quality and employability has been hardly satisfactory. The quality of education has been going down steeply, despite best efforts. In our view, the main reason for this is ineffective implementation and insufficient attention to *WHAT* students learn and *HOW* they learn.

Kasturirangan Committee has put forth an imaginative and path breaking recommendations in the National Education Policy 2020 (NEP – 2020). In this document, we have tried to augment, enlarge and crystallize few concepts and key recommendations of NEP - 2020 to re-imagine and articulate a new Vision, Purpose, Policy and Strategy for actualizing necessary reforms in Indian Higher Education by 2040.

THE VISION

Our vision of future India is that of a vibrant self-reliant nation where citizens enjoy a state of flourishing and well-being in all dimensions of life: physical-biological, pragmatic-economic, intellectual, socio-emotional, ethical and aesthetic. A population in which many people suffer from health problems lacks physical-biological well-being; a population in which a significant subset is poor lacks pragmatic-economic well being; a population in which educated people believe whatever they see in social media suffers from serious intellectual ill-health; a population in which people are absorbed in their smart phone screen and are unable to regulate their feelings of anxiety and stress are socio-emotionally ill; and a population in which individuals feel no remorse for wrong doing and have no consideration for fellow creatures lack ethical wellbeing. But going beyond these issues of ill-health, our quest is to enable citizens to have a high degree of fitness in all

these dimensions of well-being, and to flourish as individuals and as a nation.

We may view the ultimate purpose of education from pre-school to doctoral programmes as this multidimensional fitness and well-being of the individual, society, nation, humanity and the planet. To accomplish that purpose, it is imperative that we strive for a radically new form of education that paves the way for the succeeding generations to achieve what we have dreamed about. What kind of flagship education will guide our young to travel in that direction? What will help them make India not only the global hub of research, knowledge, intelligence, and innovation, but also the world leader to help humanity overcome its problems of inequity,absence of safety, hunger, poverty, intolerance, hatred, cruelty, and greed, transmuting our nation into a true leader?

With these underpinnings in place, the vision statement may be articulated as follows: 'A vibrant higher education system grounded in the integrated foundations of modern culture and the Ancient Indian culture that empower learners for a better pragmatic-economic, socio- emotional and intellectual-ethical future for themselves, their country, humanity, and the global good in harmony with sustainable development goals by embracing cutting edge technology'.

To achieve this vision, we need to clearly articulate the goals of education for each of our educational programmes: primary, secondary, higher secondary, undergraduate, graduate and doctoral, in a seamless manner. We need to translate these goals into curricula, which includes syllabuses, teaching-learning materials, classroom pedagogies, assessment, and educational policies. A detailed roadmap to move in this direction with a possible set of initiatives and a plan of action is attempted in this article.

NATIONAL EDUCATION POLICY—2020

Broadly speaking, NEP — 2020 has two types of recommendations. The first includes the principles of social justice such as access and equity, and employability. The second relates to the quality

LEARNING OUTSIDE OF FORMAL EDUCATION

The assumption that higher education can be offered only in terms of a structured university curriculum has been implicit in many attempts at educational reform for a long time. However, it is necessary to acknowledge that the connection to the industry and society at large is an extremely important component of the learning process, which is unacknowledged in the current system. The UGC is currently considering the possibility of revising the broad framework of BA, BSc, and BCom curricula to dedicate one semester of the program to having students (and ideally, faculty as well) go out of campus for their study. Urban students could go to rural areas and vice versa. Such single-semester outreach programs should be suitably structured and creditised so as to offer special incentives to students, both direct and indirect. It is possible to design several innovative ways in which students and institutions can be engaged with the society. One of the potential initiatives along these lines is that of Service Learning (SL).

of education. As stated in the previous section, even though some progress has been made with respect to access and equity, progress in quality has been hardly satisfactory. Admittedly, despite best intensions and efforts, the quality of education appears to be going down steeply. Many a time, documents on education remain as documents, not translated into effective action that influences what students learn and how they learn. This remains a potential danger for NEP - 2020 as well. In our view, the main reasons for the limited success in the past include:

i. Lack of clarity and specificity in the central concepts that describe what we expect students to learn, and the resultant vagueness in working out the implications of these concepts to the design of syllabuses, learning-teaching materials including textbooks and classroom practices, assessment, and educational administrative policies.

ii. Related to (i), putting the entire burden of raising the quality of education on teachers in classrooms, with very little attention to other factors such as syllabus design, design of teaching-learning materials, pedagogy, student assessment instruments, and policies.

iii. Absence of a coherent action plan to achieve objectives.

The vision of higher education articulated in the previous section is in harmony with the aspirations spelt out in the NEP — 2020, in such a way that it can be translated into reality by 2040, by addressing the challenges of designing curricula and using appropriate pedagogy.

THE GOALS OF EDUCATION

NEP – 2020 elaborates the purpose of education and recommends a number of valuable learning outcomes for India's education system to pursue as its goals. For instance, it states: "… education must develop not only cognitive capacities - both the 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities, such as critical thinking and problem solving – but also social, ethical, and emotional capacities and dispositions." It also recommends certain means we should adopt to achieve those goals:"Pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centred, discussion-based, flexible, and, of course, enjoyable."

Enlightenment and empowerment may also be considered as important goals of education. Enlightenment can help to create thinking and sensitive citizens of the society. Empowerment may provide means to an educated individual to earn a living for an individual, as well as to contribute to the economy of the nation. In India, the aspect of empowerment has overpowered the issue of enlightenment.

To translate this vision into reality, the government, state-run agencies, and the various boards of education need to plan carefully, and invest sustained effort. The process also needs the support of parents, teachers and administrators in education, and also citizens with a commitment to the future of the country. We propose a three-pronged approach to bridge the gap between the vision and its implementation:

1. Clarifying the important concepts in the vision statements
2. Formulating syllabuses that articulate the goals of educational programmes, namely, the learning outcomes we expect students to achieve by the end of the programme, in terms understanding, abilities, attitudes and habits of mind; and
3. Articulating an action plan for implementing the educational goals in terms of comprehensive learning materials for students (textbooks, videos, and other resources); teaching materials for teachers; guidelines on classroom activities and assessment; and programmes for teachers to develop the capacity to use the teaching-learning materials.

The goals and means of NEP - 2020 can be formulated as follows:

Goals: Education must aim to develop in learners higher order cognitive capacities, as well as social, ethical, and emotional capacities and dispositions. Higher order cognitive capacities include higher order literacy and numeracy, critical thinking, problem solving, and inquiry abilities; and an understanding of the concepts along with the core bodies of knowledge relevant to the given programme.

Means: The pedagogy must be experiential, holistic, integrated, inquiry-driven, discovery- oriented, learner-centered, discussion-based, flexible, and enjoyable. To convert these into a feasible action plan, we need to specify the understanding, abilities, attitudes, dispositions, and habits of thought that we expect to empower learners with by the end of each programme. Such specification must have sufficient clarity and detail, so that its implications guide curriculum design: syllabuses, teaching-learning materials, classroom activities, assessment tasks, as well as teacher education for every programme, for each successive year, and for individual 'subjects'.

The quality of a curriculum is a function of the value of the learning outcomes related to the goals and the effectiveness and efficiency of the pedagogical strategies related to the means to achieve the goals.

LEARNING RESOURCES AND CLASSROOM PEDAGOGIES

Given the widespread use of Internet learning resources that students have started on their own, and the recent upheavals triggered by the corona virus, it is clear that we need to carefully rethink our paradigm of higher education through class-taught courses. That a significant burden of higher education needs to move into the virtual space has become more of an imperative than ever before. We need to confront that exposition through traditional 'lectures' are not always conducive to or necessary for triggering learning in students. In many cases, they can be replaced by videos, podcasts, and readings already available on the Internet. In many cases, careful curetting of such materials from some of the best researchers and thinkers in the world can result in far richer learning than from regular class lectures. There is a treasure trove of learning resources available on internet through YouTube and other sources. If such resources are properly used, the role of faculty members would need to shift from typical 'lecturing' (summarizing and elucidating textbook knowledge) to responding to students' questions on what they do not understand in the learning resources, and engaging in discussions with them to explore further, make connections, and provide further insights, something that the video professors cannot do. In other words, the pedagogy of lecturing needs to be replaced by the pedagogy of flipped classrooms, in which learners use the learning resources instead of classroom expositions for their initial learning, and come prepared to class to ask questions, answer questions, and engage in discussions, using the classroom for consolidation and additional learning. It is high time that tertiary education in India reconceptualised the role of the faculty in higher education, instead of relying on a pedagogy that was best suited to a pre-printing era when even mass printed self-learning resources were not freely available to learners.

THE CONCEPT OF COGNITION

NEP - 2020 requires education to help learners develop cognitive capacities at two levels. The first level involves foundational and higher order capacities. At the second level, it also expects education to develop social, ethical, and emotional capacities and dispositions. 'Cognizing' is 'knowing'. Cognitive Science is the study of cognition such as bacterial cognition, plant cognition,

human cognition, and so on. It covers such things as perception, attention, recognition, memory, learning, problem solving, and decision-making. Humans share these cognitive processes with other creatures to varying extents.

The higher order cognitive capacities that NEP - 2020 expects students to develop may be viewed as those of academic cognition: the abilities of thinking like mathematicians, scientists, philosophers, historians, literary critics, and so on. These abilities need to be grounded in an understanding of the concepts of academic knowledge and inquiry. Academic cognition is the combination of these abilities and understanding.

Foundational literacy includes the ability to read and write words and sentences. Higher order literacy is the ability to process and communicate academic knowledge through the spoken and written forms of language. Similarly, foundational numeracy calls for familiarity with numbers and the arithmetic skills of adding, subtracting, multiplying, and dividing. Higher order numeracy is essentially the thinking that goes into making sense of numerically coded information. Both literacy and numeracy of the higher order involve cognitive capacities like critical thinking.

A syllabus for primary education needs to specify foundational abilities. However, given that foundational literacy and numeracy are pre-requisites for higher order literacy and numeracy, and the aim of a K-10 programme includes higher order abilities, foundational abilities need not be specified in a syllabus for secondary education. We may view these higher order cognitive capacities as those required in a General Education Programme.

THE CONCEPT OF GENERAL EDUCATION

The General Education Curriculum (GEC) aims at learning outcomes that are of value to all educated individuals, regardless of specializations, careers, and vocations.The general education strand needs to be common for all programmes, in suitable

proportion. This would empower graduates to acquire the additional attributes needed for employability, and should they choose a path outside employment, gain sufficient capabilities for livelihood, including entrepreneurship. Given NEP - 2020, we assume that the GEC would be part of the compulsory education in the K–10, and continued in tertiary education, especially as part of all Bachelor's degrees. We also assume that this strand of the curriculum would take up about 10% of the curricular time, effort, and resources.

THE PURPOSE OF EDUCATION

The quality of the curriculum of any programme is derived from its underlying conception of the ultimate purpose of education. We assume that the goal of the human institution of education as a whole is to nurture those forms of intelligences (information, understanding, skills, abilities, attitudes, habits, and mindset) that are of value to the human species.

Why aim at this goal? Because we assume that the ultimate purpose of education is to empower the young to develop a set of physical, societal, intellectual, economic/pragmatic, ethical, aesthetic, and spiritual (as distinct from 'religious') capacities that enable them to strive for their own well-being and that of others in their community and country, humanity and the planet. Education is one of the most effective means to transform the world into a better place in the spirit of the vision statement given earlier, and of sustainable development goals.

Given this goal and purpose, and the value system underlying them, we need to be clear about the attributes that are essential for an educated individual in order to work for their physical, societal, intellectual, pragmatic, economic, ethical, aesthetic, and spiritual wellness, and to participate in the struggle to make the world a better place. We turn to that question in the following section.

THE CONCEPT OF AN EDUCATED PERSON

Any attempt to rethink higher education must begin with a sufficiently clear and precise response to the question, "What do we want learners to learn?" This question needs to be discussed and debated at the national level among all stakeholders of education: students, parents, educators, education administrators, employers, and the government. To ensure that such a discussion does not degenerate into a cacophony of personal opinions, it would be useful to begin with a first draft, and invite others to submit concrete recommendations for addition, deletion and modification, along with the reasons for their suggestions.

ATTRIBUTES OF AN EDUCATED PERSON

A University-Educated person with 15-16 years of formal education must have the following attributes:

Independent Learning, Reading, and Communication: The capacity for independent learning: intellectual curiosity, combined with learning from sources of documented knowledge in the library or on the Internet, independently of teachers and schools. The ability to read, understand, and critically evaluate articles, books and videos meant for educated non-specialists and the capacity to communicate ideas and feelings with clarity and precision.

Information and Understanding: Access to the relevant information and the abilities needed for participating intelligently and effectively in a discussion or debate on a public issue, a critical understanding of the evidence and arguments for/against the core ideas of academic knowledge.

Intellectual Capacities: The capacity for critical thinking, inquiry, and integration, which includes thinking like a mathematician-philosopher-scientist without requiring specialized knowledge, combined with thinking like a designer-inventor-engineer-doctor-manager-leader-entrepreneur. The capacity to live in the world of ideas and critically engage with them. The capacity to gather data to test an empirical claim. The ability to sift away propaganda,

myths, and dogma in the search for truth in anage of fake news. The capacity to reason, and spell out the steps of reasoning, in a variety of contexts. The capacity to make informed rational ethical decisions on the basis of ethical principles shared across human communities. Other cognitive capacities such as perception, introspection, attention, intuition, insight, imagination, memory, and problem solving. The capacity to pursue courses of action to achieve the goals derived from one's value system, and critically examines the rationality of the link between the actions and value system.

Citizenry: An awareness of and commitment to one's rights and responsibilities as a member of a community, country, and humanity; a sense of global citizenship and sustainable living. A set of qualities that come under character, such as honesty, truthfulness, integrity, courage, stamina/grit, and self-discipline.

The Socio-Emotional Component: The ability to regulate one's attention and emotions, such that one can engage with life's demands, with unfamiliar situations, and with fellow human beings, in a rational, ethical, and mature way. A set of qualities that characterize a'good' human being, such as empathy, compassion, consideration for others, gratitude, forgiveness, generosity, tolerance, non-violence, including a commitment to a range of universal ethical values. Emotional maturity that includes the ability to liberate oneself from undesirable emotions like hatred, anger, hostility, irritability, intolerance, cruelty; and to nurture desirable emotions like love, compassion, caring, consideration and respect for others; the ability to accept criticism in a positive spirit; a sense of self-worth and confidence without feeling superior or arrogant; accepting support and offering support where needed, and the capacity for collaborative team work

Attitudes and Habits of Mind: Academic habits of mind such as intellectual curiosity, looking for counterexamples to knowledge claims; detecting logical contradictions; being wary of one's own biases; and clarity and precision of communication. A deep awareness of the uncertainty and fallibility of human knowledge; intellectual humility; a commitment to the values of

truth, rationality, clarity, and rigour of thinking; doubting and questioning; and democracy in the exchange of ideas and beliefs, with no place for 'authorities'.

Beauty: An appreciation of beauty across different forms and traditions of art, and the ability to defend aesthetic judgments based on shared perceptions and shared aesthetic values.

If we wish to place educatedness at the heart of our higher education, it is crucial that we drastically rethink the nature of our syllabus, assessment practices, classroom pedagogy, and teaching learning materials.

THE CURRICULUM

A curriculum for an educational programme is the sum total of the educational intervention to achieve its objectives. An ideal curriculum should have the following components:

A) ***The goals:*** The learning outcomes of the programme related to *WHAT* students should learn. This is specified in the Programme Syllabus, as distinct from the syllabuses of the individual courses that constitute the programme.

B) ***The purpose:*** The philosophy of education related to the goals and means to address the question *WHY* students should learn what is prescribed in the curriculum.

C) ***The means:*** The pedagogical strategies related to *HOW* to help them to learn what is expected.

The means in (C) include:

a. Learning Materials such as textbooks and learning resources, from which students can learn what is specified in the Programme Syllabus,

b. Teaching Materials such as lesson plans, notes on learning materials, to help the teachers facilitate the learning process,

c. The activities that teachers employ within the classroom and outside the classroom to guide and facilitate the learning process, and

d. Assessment tasks to find out if and how well the students have achieved the learning outcomes specified in the syllabus.

The curricula for Bachelor's programmes of the affiliated colleges are normally not designed by the faculty in the colleges, but by the affiliating university. Hence, the successful implementation of the Bachelor's curricula in affiliated colleges calls for a professional development system for the faculty to address (a) - (c) successfully in their classroom practice: and (d) to undertake continuous assessment to supplement the final examinations.

WHAT IS PROBLEM SOLVING?

A PROBLEM is a gap between a desirable state and an existing state; and A SOLUTION is an action or practice that results in an alignment of the two states.

The term 'problem finding' denotes the activity of identifying and formulating problems. Problem solving may be defined as the activity that leads to solutions to problems. It involves identifying and formulating the problem, finding solutions, and choosing the best one. And in the case of those that require action, it also involves implementing the best solution such that the problem is removed, or at least, minimized. The first step calls for thinking; the second also involves action.

Problems can also be those of knowledge (epistemic problems) in the world of ideas, far removed from pragmatic considerations. Academic inquiry and research deal with such problems. Inquiry is the investigation of a question, relying on our own experience, observation, thinking, reasoning, and judgment, to look for an answer and arrive at a conclusion. We inquire because of curiosity — our desire to find out something we don't know, or don't understand. The process of inquiry involves several closely connected parts. It often starts with an idea triggered by reflection, and crystallizes into a question during the process.

Rational inquiry is a specific form of inquiry. By 'rational', we mean 'in accordance with reason.' Collective rational inquiry requires us to: identify and formulate the question to investigate; think through appropriate ways to look for answers, and implement them; arrive at conclusions, based on

the answers; critically evaluate the conclusions, our own as well as those of others; and justify the conclusions to the satisfaction of the inquiry community.

Research is collective rational inquiry that aims to make a contribution to Academic Knowledge. By academic knowledge, we mean bodies of knowledge that come under categories like mathematics, physical sciences, biological sciences, human sciences, the humanities, medicine, engineering, and technology. Academic knowledge is generated and evaluated by researchers, and transmitted to learners through formal education in educational institutions.

The solution to a pragmatic problem may require a solution to an epistemic problem. Thus, to look for a solution to the general pragmatic problem of cancer requires us to solve the epistemic problem of the causes of cancer, and use that understanding to develop a course of action. For a doctor to solve a particular problem of the illness of a particular patient, she would need a diagnosis to understand the causes of the problem, and then use that understanding to look for a cure.

BLENDED PEDAGOGY

We should not continue to classify education based on mode of delivery such as campus-based, correspondence, external, distance learning, online, etc. It does not make sense to offer education exclusively by any of these modes. Our education must be provided through blended pedagogy by using the strengths of every mode of delivery. Broadly this can be divided into four parts.

a) A substantial component of most programmes involves delivery of information. Earlier 'lecture notes' that gave information to students was their power. Today in the 5G world teachers are not required to do this. Students are much smarter at getting information if they are properly mentored. This component can be handled by creating an online information repository where students can self-learn. Social robots can do this job easily.

b) Every programme involves a theory component where the available information needs to be used to understand

the basic principles of the respective subjects. This can be done by developing high quality MOOCs supported by teachers as mentors.

c) Understanding the importance of theory requires intense interaction with teachers. This component will have to be in the classroom where the teacher is an active facilitator.

d) Hands-on / practical / internship / apprenticeship programmes which can happen in campus laboratories/ workshops/ industry sites / any other suitable place.

If we divide the entire teaching of a programme equally into these four broad components, the actual need for 'Teacher on Campus' may be required only for about half of the teaching duration of any academic programme. In the case of non-professional undergraduate programmes the proportion may vary. In any case, we should be able to offer at least 40 % of the teaching with help from technology, be it online or otherwise. The new Regulation of the University Grants Commission (UGC) allows this. For this purpose we will need an entirely different breed of teachers. This approach may save a significant portion of resources and may substantially reduce the number of academic faculty.

Adopting such a blended approach may have several advantages: First, it may empower students to earn academic credits for component (a) at their own pace and convenience. Second, the quality of education will improve because of a new focus on learning-by-doing in the blended mode. Third, infrastructural needs on the campus may be reduced. Fourth, mass production of poor-quality degrees under the pretext of open/ distance/ online programmes can be controlled. Fifth, access to education will be enhanced due to use of technology in delivery. Sixth, the cost of education will be drastically reduced, making it more affordable.

INDICATORS OF QUALITY

It is important to remember that while professional programmes like MBBS, BTech and LLB aim at producing professionals in a given

field, there are no particular professions meant for those who have undergraduate degrees such as a BA or a BSc in subjects like physics, philosophy, mathematics or history. The graduates in these disciplines may not find jobs that call for specialized knowledge of their principal subjects. Assuming that education ought to prepare learners to meet the challenges that graduates are faced with in their life after graduation, what do these courses prepare graduates for? A sensible position would be that it helps them develop an educated mind, such that graduates have the capacity to learn what they wish to learn, or are required to learn as part of their professional obligations; can communicate clearly and precisely; can work productively in teams; are good at critical thinking, problem solving, and decision making; and so on.

The indicator of the quality of our professional undergraduate programmes would be the percentage of graduates who become high calibre practitioners in their respective fields. The indicator for non-professional undergraduate programmes would be how well-educated they are, regardless of their specialisation. Measuring this capacity would call for developing our own instruments to measure the educatedness of individuals. The indicators of the quality of programmes of higher education are given in Table 1.

Table 1: Indicators of Quality of Higher Education Programmes

Type of Programme	Indicators
Doctoral	Number of students from prestigious universities abroad seeking admission to Indian programmes; number of publications and citation index of the graduates after they have graduated; appointments in prestigious organizations
Master's: Research-Oriented	Admission to prestigious PhD programmes
Master's: Professional	Number of high caliber specialist practitioners

Type of Programme	Indicators
Master's in Basic subjects	Number of graduates with specialist understanding capable of innovative application.
Undergraduate: Master's-oriented	Number of graduates admitted to high caliber PhD programmes abroad
Undergraduate: Professional	Number of high caliber general practitioners
Undergraduate: Vocational	Number of accomplished practitioners
Undergraduate: Educatedness-Oriented	The educatedness of the graduates, as measured in terms of a test that probes in the relevant attributes

Making a significant improvement in these indicators should be the primary target for 2040.

ASSESSMENT

Towards the end of the 20th century, considerations of objectivity and avoidance of corruption led India to adopt a system of computer-gradable Multiple Choice Questions (MCQs) for Board Examinations, Aptitude Tests, and Entrance Examinations. These MCQ-based tests/examinations are designed such that each question has to be answered in less than two minutes. In some tests, like the Eligibility Tests for school/college teachers, the time available to answer a question is just one minute. Very clearly, such questions leave no space for thinking — let alone critical thinking or creativity — before answering. This form of assessment is deeply flawed in terms of equity, operationalization, and validity.

Equity: Given the coaching industry that trains the young to do well in examinations, those who do well are typically from the urban population, and belong to the higher end of the socio-economic spectrum, — those who can afford to pay the exorbitant fees set by the high-end coaching factories. This defeats the entire consideration of equity, because the system discriminates against the poor and the rural.

Validity: The validity of measuring instruments (such as achievement tests, entrance tests, aptitude tests and intelligence tests) depends on what the instrument seeks to probe into. To design an intelligence test, for instance,

we need to have a clear idea of what 'intelligence' is, and a theory of intelligence that connects the abstract quality of intelligence legitimately to measurable atomic attributes.

Our entrance tests are designed for high-speed mechanical application and recall of memorized information. They are therefore not operationalized to probe into higher order cognitive abilities such as deep understanding, critical thinking, and innovativeness. In these tests, candidates with the surface smartness to answer questions at high speed without thinking can score high marks. By selecting such candidates, we actively eliminate the thinkers and the creators in India's student and teacher populations. This strategy guarantees reducing the country's systems to mediocrity: Einstein, Srinivasa Ramanujan, and Tagore would have flunked these tests and examinations, and would have been denied the opportunity to pursue higher education or teaching.

Reliability: As far as we can tell, the validity of these testing instruments has never been investigated, let alone demonstrated. This means that there is every possibility of arbitrariness in the selection for higher studies and for employment. There is a high probability that those who are assigned to the top 1% in one test may not score as well in an equivalent test given to them a week later, and that they may end up below the top 10%. The reverse is equally probable: someone who falls in the 89th percentile in one test may rise to the 99th percentile in the second test. Given admission criteria set by institutions at, say, 94%, selection for admission would be entirely arbitrary.

We would like to recommend that all forms of tests and examinations that rely on two minute or one minute MCQs be done away with, and that they be replaced by questions or tasks that call for deep understanding, critical understanding, critical thinking, and inquiry abilities. Such questions, called 'Enhanced MCQs' (EMCQs), can be framed in a computer gradable format if we allow for sufficient time for thinking and reflection, ranging from 10 to 20 or 30 minute per question; 10 to 20 options to consider for each question; different options for each question to carry different marks; the need to tick multiple options in order to get full marks for a question; and penalty for picking inappropriate options.

To avoid public panic and unnecessary media storms, an assessment reform of this kind will have to be done in a careful, tactful and graduated manner. For this, we recommend the following phases:

Phase 1: Identifying a small number of talented academic faculty (say between 10 and 20) who can learn to create EMCQs, and training them in the art and craft of EMCQs.

Phase 2: Creating a question bank of a reasonable number of EMCQs.

Phase 3: Trying out the EMCQs in aptitude tests of the kind needed for NCERT's Talent Search.

Phase 4: Sensitising the students and the public to the need of reform in the nature of assessment, and winning their support

Phase 5: Using EMCQs in entrance tests

Phase 6: Using EMCQs in final Board Examinations

Phase 7: Training faculty in creating EMCQs, and in classroom activities aligned to such questions.

EDUCATEDNESS, EMPLOYABILITY, AND ECONOMY

As stated earlier, enlightenment and employability have been the driving powers of education. In this section, we argue that as far as general education is concerned, empowerment is derivative of enlightenment.

Indeed, expertise in the respective area of specialization is an important consideration for professional and vocational programmes. However, this does not automatically translate as employability. For instance, those who receive degrees in engineering, medicine or management may choose to be self-employed, through private practice, entrepreneurship, or other means of remuneration such as financing, banking, farming, cooking or private consultation. Unless we factor in those who choose these paths, the percentage of graduates who are employed will not be a reliable indicator of the economic viability of an educational programme.

The bulk of learners in higher education in India are registered in programmes that offer BA, BSc or BCom degrees. Thus, as far empowering graduates to make a decent living is concerned, our primary consideration ought to be these programmes. Even after factoring in those who choose self- employment, it is widely acknowledged that the majority of even those graduates of our undergraduate programmes who seek employment are unemployable. The population is rapidly increasing and so is the number of educated

individuals; however, their skills are not aligned to the changing needs of the society and capacity of the nation to create new jobs. This in turn has been causing educational imbalance.

The solution to this problem is not equipping them with the skills and information needed for particular jobs. In fact, attempting that would be a serious mistake. As NEP - 2020 points out, one doesn't know what job one would need to do in the future, and what abilities it would require. A liberal arts education prepares one for a variety of jobs, and transitions across jobs. Such an education is crucial in today's fast changing world. Clearly, our undergraduate education needs careful revamping. However, unemployability is only a symptom of the problem, not its cause. The cause, what makes our system of education dysfunctional, lies in the fact that we mass produce degree holders who are not educated in the real sense of the word.

What does 'educated' mean? What distinguishes a well-educated degree holder from a poorly educated degree holder? And what is the difference between a well-trained degree holder, and a well-educated degree holder? The answer lies in the attributes that we have indicated as being those of a generally educated person.

The general education strand needs to be common for all programmes, in suitable proportion. And a well-educated person will automatically have the attributes that make them employable if they choose the path of employment. They would have already acquired enough capabilities to make a decent living through self-employment. This includes a change in our culture, about our attitudes of 'respectable' and not so respectable career paths. We need a culture in which farmers, tailors, cooks, cobbler, goldsmiths, wood workers, *tabla* makers, and home makers are as equally respected in society as Indian Administrative Services (IAS) officers, Chief Executive Officers (CEOs), doctors, engineers, lawyers, etc. The undue glamour attached to hollow 'graduate degrees' needs to be recalibrated. We need citizens to be well- educated whether or not they have degrees and certificates, whether or not they are home makers or CEOs. If not, our society will continue to be dysfunctional.

As mentioned earlier, unless tempered with considerations of excellence in quality, the pursuit of employability can be detrimental to the quality of education we provide. We may now add that even for employability, the pursuit of educatedness ought to be the primary consideration.

Educatedness is a concretization of the aspirations of liberal education recommended in the NEP - 2020. General Education includes the ideas of liberal education, but goes beyond it in many respects. As the NEP - 2020 recommends, we believe that some of the courses in the general education programme can and should be introduced in Professional Bachelor's Programmes such as BE, B.Tech, MBBS, LLB, BArch, B.Pharm., and such.

It is unwise to prioritize one domain of knowledge over another in terms of their practical considerations. All types of knowledge are equally good and important. Undue overemphasis or glamorization of particular disciplines such as technology or medicine is conducive neither for education system nor for the society. For instance more focus on STEM (Science, Technology, Engineering, Mathematics) or within science more emphasis on PCM stream (Physics Chemistry, Mathematics) has adversely impacted disciplines of humanities and social science. After independence, our government promoted more number of premium national institutes in technology, management and medicine such as Indian Institute of Technology (IITs), Indian Institute of Management (IIMs) and All India Institute of Medical Sciences (AIIMS), which is good. However, importance of similar stature national institutes in humanities and social sciences should not have been ignored. The creation of unitary institutions and national research laboratories in the higher hierarchy to the universities and continuation of affiliating college system are some or a few other problems of Indian higher education system. A concept of typical Indian Institute of Technology, Indian Institute of Management, All India Institute of Medical Sciences and such has created uni- dimensional individuals with myopic vision or possibly underdeveloped right brain. For a large and culturally diverse society like India, a comprehensive seat of learning with multiple disciplines of knowledge is necessary. The NEP - 2020 makes this

clear by defining the term University correctly. Making a significant improvement in terms of the quality of education and parameters of educatedness should be an important target for 2040.

TRANSFORMING THE ETHOS OF EDUCATION

The strategies recommended in the previous sections are bound to create a profound transformation of education in India, all the way from pre-school to doctorate. Thus, the role of the educational culture that these changes are to be located in should not be underestimated. This would mean slow and patient efforts to educate the students, their parents, teachers, textbook writers and editors, education administrators, NGOs, education boards, and policy makers on what these changes represent and how we can affect the cultural transformation needed for the changes. The paradigm of Intelligence-and-Wellbeing-Oriented liberal education is different from the currently predominant Economy-Oriented formal education, which carry the following axioms on the purpose of education:

a. ***Economic advancement of the Individual in the view of typical learners and parents***: To help the young do well in examinations so that they can proceed to specialized higher studies to help them compete in the job market to make a good living

b. ***Economic advancement of Corporations in the view of the corporate sector:*** To equip the young with the information and skills to make them employable, to serve the manpower needs of the industry

c. ***Economic advancement of the Nation in the view of the government:*** To develop the human resource needs for the economic progress of the nation.

In terms of the economy-oriented paradigm of education, we see that economic advancement or economic development (often measured in terms of GDP) is economic flourishing, as one of the strands of flourishing. In terms of this general concept, consider the following positions on the purpose of education:

d. ***Future Flourishing of the Learner:*** To help the young develop the capacity to work towards their biological, material/economic, emotional, intellectual, aesthetic, and ethical flourishing.

e. ***Future Flourishing of the Nation:*** To help the young develop the capacity to work towards the collective material/economic, socio-emotional, intellectual, aesthetic, and ethical flourishing of the nation.

f. ***Future Global Flourishing:*** To help the young develop the capacity to work towards the material/economic, socio-emotional, intellectual, aesthetic, and ethical well-being of the planet and its creatures, including humans.

The well-being oriented paradigm of education assigns priority to d-f, but it includes a-c. Within the economy-oriented paradigm, students and parents are concerned only with certificates from prestigious institutions and programmes, and the grades they are assigned in these programmes. So they often ask about the 'scope' of a particular degree, by which what they mean is - If the students get a degree in X from institution Y, how much money can they make?

Such campus placement-based, salary package-driven education culture may be detrimental to the basic ethos of education.

We need to educate the entire nation to switch from degrees and grades to the quality of learning. Educated people in the true sense have a far better opportunity to pursue their well-being, including economic well-being. The NEP - 2020 rightly states that one never actually knows what one's job is going to be in the long term, or what work it will entail. The purpose of a liberal arts education is not simply to prepare for one's first job, but also for one's second job, third job, and beyond. With the coming fourth industrial revolution, and the rapidly changing employment landscape, a liberal arts education is more important and useful for one's employment than ever before.This is what we must help students, parents, and others understand and appreciate, so that they can wean themselves from the culture of Economy-Oriented formal education to the culture of Intelligence-and-Wellbeing-Oriented liberal education. That is going to be a gigantic task.

THE ANCIENT WISDOM IN THE MODERN WORLD

What kind of university education can make students become educated? Can we establish contemporary Gurukula University? This is not going to be easy, but if we do not aim higher and spell out each strand of the curriculum, even small improvements would remain unrealised. It is important to unearth the implications of getting outside the box. For instance, suppose a newly setup university were to design an undergraduate programme that:

1) *Abandons ill-conceived and harmful distinctions like physics vs. chemistry or natural sciences vs. 'social' sciences;*

2) *Organises the entire curriculum around questions to investigate, (instead of departments and schools);*

3) *Devotes the first year to compulsory foundation courses on trans-disciplinary inquiry and trans-disciplinary understanding;*

4) *Devotes the second year to compulsory foundation courses on multi-disciplinary questions (e.g., who are we as members of the human species? how did the physical, biological, and cultural worlds evolve to be the way they are now? How do we minimise the most serious problems that confront the world today (e.g. violence, poverty, inequity, dissolution of democracy, ...)?*

5) *Devotes the third year for preparation for specialisation at the Master's level.*

The role of a teacher is extremely important in this process. It is necessary to understand the classification of the concepts of teaching implicit in the words for 'teacher' in Sanskrit: Adhyapak: A teacher who merely transmits information; Upadhyaya: One who helps learners connect and integrate fragments of information into knowledge, and develop understanding; Acharya: One who, in addition to these, provides training in a set of skills; Pandit: One who goes above and beyond these and is able to give deep insights in the specialized subject; Drashta: One who brings visionary views, nurtures inquiry and critical thinking; Guru: One who is able to awaken wisdom and shows pupil a way from darkness to light. We note that attributes of educatedness are directly relevant to the classification of teachers in the Ancient Indian system.

If we extend the categories from teachers to the entire curriculum design, we may say that we must aim to raise our curriculum from an

adhyapak curriculum to a gurukula curriculum.The decision-makers who seek a gurukula education are obliged to permit (1)-(5). It would be valuable to draw out the implications of bringing the ancient categorization to the modern world, to the specifics of curriculum design and educational policies. We are all aware that there was a vibrant and rich pursuit of knowledge, inquiry, and education in Ancient India. It would be of immense value not only to India but also to the world to bring this knowledge system back to the design of modern universities. For this, it is important to introduce university students to the ancient bodies of knowledge such as Panini's linguistics, ancient Indian mathematics and astronomy, ancient medicine, ancient logical systems such as Buddhist, Jainist and Nyaya logics, and so on. But this is hardly sufficient: it is equally important to integrate that knowledge with the modern/western systems.

The ancient Indian tradition was not a monolithic one. There were traditions that subscribed to the concept of a creator God, but there were also those that denied the existence of a creator God. Charvaka viewpoints were equally respected. There were traditions that accepted the infallibility of the Vedas as a source of knowledge, but there were also those that rejected it. There were monistic systems of advaita, as well as systems of dvaita that subscribed to the dualism of purusha and prakriti. This culture flourished in an academic ethos of doubting, questioning, disagreeing, and debating, with an awareness of the uncertainty and fallibility of human knowledge and the impossibility of absolute knowledge.

Take the following quote: "Whence this creation has arisen – perhaps it formed itself, or perhaps it did not – the one who looks down on it, in the highest heaven, only he knows – or perhaps he does not know." Mandala 10, hymn 129, verse 7. As we see it, the intellectual humility present in this verse is worthy of an Einstein and Feynman, but modern India has replaced it with intellectual arrogance and smugness of certainty. It is important for Education in India to bring back what we have lost, and create an intellectual culture of doubting, questioning, disagreeing, and debating, with an awareness of the uncertainty and fallibility of human knowledge and the impossibility of absolute knowledge, consistent with the view of educatedness.

INITIATIVES IMPLEMENTED

The University Grants Commission (UGC) has taken a number of significant initiatives to improvethe quality of higher education along with promoting quality, access and equity. The ten verticals of UGC

Quality Mandate include: Student Induction Programme, Learning Outcomes based Curriculum Framework; ICT in Teaching Learning Process; Life skills; Social and Industry Connect; Evaluation Reforms; Career Progression and Alumni Network; Faculty Development and Mentoring; Strengthening accreditation process, and promoting Research and Innovation. The focus on value based education and respect to environment and sustainability have been strengthened through *Mulya Pravaha* for value education and *Satat* guidelines for sustainable campus.

Additionally, in line with the NEP - 2020 recommendations of liberal education with a multiple- entry multiple-exit mechanism, the UGC is attempting to create a student-centric, flexible, multidisciplinary academic system. The Academic Bank of Credit (ABC) is one such step in this direction. A new Scheme for Trans-disciplinary Research for India's Developing Economy (STRIDE) to promote quality research by faculty and students has been announced. The UGC has set up a Consortium for Academic and Research Ethics (CARE) to identify, continuously monitor, and maintain a 'Reference List of Quality Journals' across disciplines. The Semester Outreach Programme, Service Learning, Embedded Internship Programmes, Apprenticeships, Work-Linked Education Programmes are some more examples of new initiatives in the advanced stage of implementation.

A NATIONAL THINK TANK

To think through, oversee, and implement the intended initiatives the government should set up a National Think Tank (NTT), to be responsible for putting together detailed syllabuses, teaching-learning materials, recommended pedagogical strategies, assessment tasks, and policies, grounded in sound educational philosophy, and the cognitive neuroscience of learning.

As part of NTT, a team of high calibre educator-thinkers should be established on priority to develop the Programme Syllabuses, sequenced syllabuses, textbooks, MOOCs, assessment tasks, and teaching resources. The next step would be to select a few highly

motivated teachers from the academia across the country, to be trained as mentors to provide value-added help to the learners who need additional help to learn from the MOOCs and textbooks.

It is not necessary that NTT be housed in a centralised building in a capital. We may view this as a distributed network, with members working from different locations, but interacting with one another through the digital channels, and coming together when needed, for face-to-face meetings. We recommend that NTT be composed of different clusters of specialisations, and different layers, ranging from the national, to the state and to high calibre individual institutes and universities.

CONCLUSION

In this chapter, we have attempted to connect a philosophical vision of the future of India with what learners actually learn, and how teachers help them to learn. Working out that connection with sufficient clarity and precision is an important means to achieve the vision, resulting in a gradual transformation over the next thirty years.

The vision and its actualisation would be mediated through a clear statement of an educational philosophy of the ultimate purpose of institutional education, from Kinder Garten (KG) to PhD. The design of curricula for various programmes need to be guided by that purpose, with the Programme Syllabus clearly spelling out the understanding, abilities, habits of thought and attitudes that we expect students to imbibe through the programme. To achieve the learning outcomes specified by the Programme Syllabus, we need to produce learning materials for students as well as resources for teachers. For the success of the programmes, the assessment tasks need to be designed such that they actually probe into the learning outcomes specified in the syllabus.

At the heart of these proposals is the thrust on Higher Order Cognitive Capacities (HOCCs) mentioned in NEP - 2020. What we have presented in this chapter may be viewed as a detailed action plan to achieve those outcomes.

Central to this enterprise is a clear understanding of what we expect of educated citizens, regardless of their specialisation, career paths, or professions. In alignment with this idea, the chapter has outlined a desired syllabus for General Education as a strand that runs from school education to PhD. The programmes of specialised education such as Bachelors in Physics, professional education such as Civil Engineering, and vocational training such as Physiotherapy, need to be built on the foundations provided by the General Education Curriculum.

As part of this enterprise, we have made several specific proposals. One of them involves going beyond campus learning to such paths as learning from curated internet resources, service learning and apprenticeship learning. We also propose a way of unifying the ethos and substance of Ancient Indian knowledge with the ethos and substance of modern knowledge, using examples from medicine, logic, and philosophy.

Finally, to actualise the vision and linked proposals, we have recommended setting up a NTT as a virtual, multi-sector, multi-speciality think tank to provide extensive professional guidance and oversight.

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Disclaimer: **The views expressed in this chapter are personal positions of the authors. We have restricted scope of this chapter mainly to scholarly academic aspects and have refrained from discussing the structure and governance aspects. We feel that 'Structure should follow the Strategy, which should follow Goals and Purpose' and NOT the other way. We feel that the Laws and Regulations should be primarily based on academic pursuit and not merely to suit administrative, political or economic conveniences. We have tried our best to articulate a global position on higher education that would be of value to India, and at the same time, attractive to the pursuit of higher education outside India, without any intention to either glorify or undermine any historical, geographical, or cultural perspectives. Several terms, concepts and models in this chapter have not been fleshed out in detail due to limitations of space. However, a more elaborate version with extensive examples will soon be available, perhaps with a range of position papers on the different strands briefly mentioned in the chapter.**

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