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ANNOUNCEMENT

Special Number of the University News
on
'Implementing National Education Policy–2020 to Transform Higher Education in India'

A **Special Number of the University News** on the theme **'Implementing National Education Policy -2020 to Transform Higher Education in India'** is being brought out in the month of **March, 2021.** The **Special Issue** will cover articles of experienced and eminent educationists, higher education practitioners and policy makers. Readers of the University News are also invited to contribute to the Special Number by submitting papers/articles on below mentioned themes:

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Inbound Student Mobility in Indian Higher Education: A Concern for Gendered Realities#

Mona Khare* and Sonam Arora**

The increasing demand of advanced qualification fuelled by an enthusiastic young cohort for better employment opportunities has given a new direction to globalisation and internationalisation of higher education. As a result, fostering 'international knowledge'; 'international technology' and 'international workforce' became the priority of countries, developed and developing. Globalisation and internationalisation are closely related yet, two different phenomena (Altbach & Knight, 2007). Globalisation on one hand is a market mediated process led by economic rationality and commercial interests while, Internationalisation of Higher Education (IoHE) is a response to opportunities and challenges of globalisation. It is thus little wonder that International organizations like the Organization for Economic Cooperation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), World Bank, the European Union, Regional associations like the Commonwealth, the Association of Southeast Nations (ASEAN), Universities as well as national governments strive to forward internationalization, in a more defined and strategic fashion.

International education has become an industry, a source of revenue and a means for enhanced reputation (Wit, 2020). The whole movement of HE internationalization is being fuelled by increasing individual capacities to self finance international education and institutional requirements to improve their branding, reputation and global ranking. International Student (IS) mobility is an important tool of 'soft power' that refers to country's capacity to influence another country's collective attitude and behaviour as a result of non-coercive and non-threatening factors (Nye Jr., 2004). IS are considered as carriers of international knowledge and competency. Today internationalisation is understood in a much broader framework of "internationalisation abroad" and "Internationalisation at home (IaH)" (Knight, 2008). Internationalization abroad can be predominantly understood as 'preparing to go out', while internationalization at home may best be understood as 'preparing to host' (Khare, 2019) as the former may be measured by people and program mobility while the latter with curricular and pedagogic structures, campus environment and outcomes. Although, developed parts of the world profess and promote

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shift from former to latter, the basic driving force continues to remain international student recruitment, more particularly income generating international students. As such, student mobility continues to remain its most dominant manifestations as well as national aspirations. Countries across the world are trying to improve inbound international student flows by charging differentiated tuition fee, offering aid, scholarships and loans. Little would then one wonder, if one of the biggest source nation for IHE, India is focusing more on the mobility aspect in its attempt to emerge as a regional education hub (Khare, 2015) and correct its adverse inbound-outbound international student mobility (Khare, 2018).

Inclusive Internationalisation: Mapping Gender Gaps

Today, the modified definition of internationalization (Wit, Howard, & Egron-Polak, 2015) clearly emphasizes that it should be more inclusive and needs to be channeled in such a way that 'it is shouldn't only be of interest to a small elite group of mobile students and scholars but directed to all students and scholars'. Academic mobility is a result of various factors ranging from higher education capacity, personal and professional goals and human capital targets for nations as well as a whole range of socio-cultural and economic factors for households and individuals. In the light of an increasing mode of self- financed IHE (Khare, 2014) and greater focus on recruiting income generating international students, more vulnerable sections like women, ethnic groups, and minorities, economically backward are likely to get further marginalised. Some insights into the gender aspect of IHE in India may help guide the recent initiatives of the Government of India (GoI) to promote inward student mobility (Khare, 2018) with a gendered lens.

UNESCO (2006) has identified and defined three important indicators of estimating inbound mobility rate – *(a) absolute numbers hosted* defined as number of mobile students from abroad studying in a given country; *(b) Inbound Mobility Rate* (IMoR) defined as mobile students in a country/ region as a percentage of the total tertiary enrolment in that country/region and; *(c) distribution of mobile students by host country* defined as mobile students studying in a country/region as a percentage of total number of mobile students globally. It is well understood that while analysing equity in participation, gender questions cannot be restricted to estimation of gender differences in number of women and men enrolling in HEIs but have to be extended to the fields of study (UNESCO, 2006). We use three indicators to study the gender dimension of the inbound student mobility: (a) Gender gap in absolute numbers (b) Gender gap in inbound mobility rate and (c) Gender Parity Index. We also map the gender disparities across major countries of origin and programmes of study.

Gender and Inbound Student Mobility: Select Country Trends

The international pool of graduates has evolved in OECD G20 countries and is expected to increase in the coming 15 years with countries that lagged behind in the initial phase to experience faster growth while countries that recorded large gains to experience a slower growth. The OECD estimates that 4.6 million crossed a border to pursue an international education experience in 2015, demonstrating a massive increase from 2.1 million students who went abroad in 2001 (OECD, 2017; Project Atlas, 2017). Gender gaps are distinctly visible in internationally mobile students at the global level. In general, gender gap exists in majority nations in disfavour of female students and its manifestation in widening at the global level. Gender parity (with the share of women being higher than men at bachelor's and master's level and lower in doctoral programmes) is observed in less than one-third of OECD member and partner countries (OECD, 2019). Looking at the top 10 countries from 155 different countries across the globe that constitutes 64 percent of the total foreign students in India, similar observations can be made. These countries are Nepal, Bhutan, Iran, Afghanistan, Malaysia, Sudan, Iraq, Sri Lanka, US and UAE. . Not only the share of women in globally mobile tertiary students from these countries reveals harsh reality of being gender biased but the gender gap as a whole has gone up from 1.9 pp in 2011-12 to 3.0 pp in 2017-18 (Table No. 1). A look at the country figures provides a very sketchy picture. Although, the gender gap has declined over the years in Bhutan, Sudan and Afghanistan it continues to remain much higher than others in these three nations. On the contrary, the countries like US, Sri Lanka and Malaysia not only have low gaps but present a contrasting trend with negative gap indicating higher female share. While there is a sharp increase in gender gap in Nepal there is a decline in Iraq and it

remains close to zero in the case of Iran and UAE. The gender analysis thus provides a mixed picture as far as countries are concerned and it is difficult to draw any patterns.

Gender and Inbound Student Mobility in India

As in many other parts of the globe, it is internationalization abroad that overweighs internationalization at home currently in India. Efforts to improve inbound mobility and IaH have become government prerogatives at the systemic level, in recent times. India aims to quadruple its foreign student numbers in the next five years, from 46,144 in 2018 to 200,000 by 2023 (Government of India, 2018b). To achieve this, financial support is being provided through full or partial fee-waivers or scholarships under the General Cultural Scholarship Scheme (GCSC). Additional intake capacity is made possible by reserving seats for foreign students and creating additional intake capacity on pro-rata basis. India could account for a large share of OECD G20 pool of tertiary-educated young adults in 2030 based on the expected educational attainment and demographic changes. As per the forecasts, India will become a home to the largest tertiary-aged population (119 million) and will have the highest number of tertiary enrolments (48 million) followed by China (37 million) and the US (22 million). But, currently, the percentage of international students of total enrolments in higher education in India remains as low as 0.1 percent (Project Atlas, 2016).

The export-import student Ratio in the country is as skewed as (11:1) (Khare, 2018). In 2016-2017, 47,575 international students were studying in India, a mere 0.67 per cent of all globally mobile students. The majority (60 per cent) of international students in India come from neighboring South Asian nations (Government of India, 2018). Are these international student flows also skewed across gender? If so, then what are the policy implications of such gender disparity are the main concerns in the following sections. Using the three indicators of gender gap as mentioned in the earlier part of this paper we divide the last decade into two sub-periods to study the shift between 2011-12 to 2014-15 as sub-period I and 2014-15 to 2018-19 as sub-period II.

(a) Gender Gap in Absolute numbers

A trend analysis of absolute inbound students hosted in India shows that since 1986, the numbers have seen ups and downs. In 1986, the number of international students in India was 10,877 which rose to 13,707 in 1993. After that the numbers started declining and touched an all-time low of 5,323 in 1998. Since then, the numbers have been increasing to touch 47,575 in 2016-17. Also, foreign student representation by way of number of countries increased rapidly. The highest increase in inward mobility can be seen from Asia, 60 per cent of them coming from neighboring South Asian nations. Their numbers have seen a drop from Africa, increase from US and remained almost stagnant from Europe. Among the top ten source nations to India, Nepal continues to occupy the top position with almost 40 per cent share from the beginning of this decade.

Overall, there is poor representation of foreign women in international student community in India (merely – 32pc). Rather the share of women foreign students has seen a drop from 37 per cent in 2010-11 to 31 per cent in 2017-18. Analyzing the trends in sub-periods, we see that the total number of IS has

Table 1: Male-female gap in IaH (pp)

Country	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Nepal	3.4	3.5	5.6	6.7	8.0	8.8	7.9
Bhutan	15.3	9.3	19.9	12.5	10.4	8.4	6.6
Iran	0.0	0.2	0.0	-0.2	-0.1	-0.3	0.2
Afghanistan	18.2	18.8	11.0	15.9	14.5	11.8	11.5
Malaysia	-0.7	-0.8	-1.0	-0.1	-0.8	-0.7	-0.5
Sudan	16.2	16.8	16.4	15.2	13.2	12.7	14.0
Iraq	9.1	9.1	8.5	4.1	2.8	1.7	1.1
Sri Lanka	-0.9	-0.7	-1.1	-2.0	-1.0	-1.2	-0.7
US	0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1
UAE	1.7	1.3	0.8	-0.9	-1.2	-0.7	0.5
Total	1.9	2.0	2.5	2.6	2.8	2.8	3.0

Source: UIS, UNESCO and AISHE

gone up in absolute figures from 21,359 in 2011-12 to 27,696 in 2018-19, Of these although both male and female students witnessed an increase, the increase in male students has been much faster in the sub-period I while that of the female has remained sluggish (Fig 1). Also, there is a sharper drop in the number of Female inbound students in both the sub-periods II from 38 per cent to 34 per cent and 34 per cent to 29 per cent.

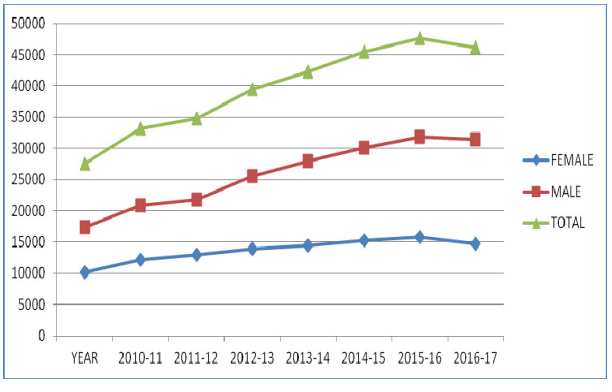
Gender Gap in IS Numbers by Country of Origin

Surprisingly, women representation from developed parts like US, Europe is higher (50 per cent) than from Asia and Africa. We see a sharp decline in enrolments in the sub-period II as six out of the ten countries recorded a decline except Nepal, Afghanistan, US and UAE (Table No.2). This decline is largely explained by decline in overall women enrollments and a rise in overall enrolments by men. The male-female gap is considerably high in all countries except Malaysia and Sri Lanka, with the highest rise in Nepal. The gap is the highest for Afghanistan which is testimony of the gendered outbound mobility in these countries.

(b) Gender Gap in Inbound Mobility Rate

The IMoR remains higher for men vis-à-vis females for all the courses and for both the sub-periods. The gender gap has also widened in the overall period, much of it explained by the rising gap in sub-period II (Table No.3). Further dissection reveals that women have greater preference for full time long term regular programme (90pc +) with UG courses leading the race. Only 20 per cent of foreign women are enrolled in PG courses while the figure is in single digits for Ph.D and others (Khare, 2019). For every 1200 Indian female students at PG and UG level, there is one foreign female student in HEIs against 480 Indian male students for one foreign male student. The disparity is much higher at Diploma and PG diploma levels where for every 3500 female students; there is one foreign female student as against 380 male Indian students for one male foreign student.

Fig. 1: Number of Foreign Students in India Total Year-wise



Another distinctive observation is in terms of Ph.D. programmes. With the IMoR for men and women being almost at par in 2011-12, it has continuously declined for both male and female but the decline is much steeper for female. The rate for male has seen a 0.44 pt drop while for women it is almost 1.3 times more. It reflects a worse scenario in which both the host country (India) and the home countries have failed to induce/improve international mobility of female students.

(c) Gender Parity in Inbound Mobility

The increasing existence of gender bias in inbound mobility of IS in India is further substantiated by a decline in Gender Parity Index (GPI) in IHE. GPI for IS has declined from 0.61 in 2011-12 to 0.43 in 2018-19 (Table No. 4). The sharpest decline is recorded in short term (certificate and diploma) and M.Phil level of education. The gender parity in inbound mobility has been falling continuously through the two sub-periods. However, the decline is marginally higher in the recent years, thus indicating at a worsening situation.

The index is comparatively higher for short duration courses especially PG Diploma. The declining gender parity in IS could possibly due to two reasons , one women from other countries are not keen on taking up higher education in India (demand side) or Indian policies are not able to attract women candidates from abroad (supply side).

Conclusion and Policy Implications

The top agenda of "India becoming a education hub" is profuse in policy discussions. In its desire to emerge as a regional education hub, there is a marked shift in India's approach, which consists of becoming proactive at the systemic level to promote IaH targeting at improved inward mobility. Several programmatic steps led by the government have been taken to make India an attractive destination. Among government's major initiative are Global Initiative of Academic Networks, Scheme for Promotion of

Table 2: Enrolment by Country of Origin

Country	Enrolments (absolute)			Male-female gap (pp)		
	2011-12	2014-15	2018-19	2011-12	2014-15	2018-19
Nepal	6346	8694	12747	16.0	27.5	47.4
Bhutan	2660	2698	1811	13.7	19.0	12.8
Iran	2329	1544	1127	-1.1	-5.6	1.0
Afghanistan	2235	3717	4657	76.0	83.5	75.3
Malaysia	1767	1924	1087	-23.5	-2.9	-28.2
Sudan	1516	2104	1905	83.5	84.1	74.4
Iraq	1514	1263	498	79.0	53.8	58.2
Sri Lanka	1207	1610	1252	-12.8	-20.4	-10.4
US	983	982	1562	1.1	-3.9	-8.3
UAE	802	1284	1050	18.2	-6.5	15.4
Total	21359	25820	27696	23.9	30.5	40.1

Source: computed using AISHE data

Table 3: Inbound Mobility Rate of IS

Course	2011-12		2014-15		2017-18	
	male	female	male	female	male	female
Ph.D	0.85	0.84	0.58	0.38	0.41	0.28
M.Phil	0.21	0.15	0.07	0.04	0.04	0.01
Post Graduate	0.21	0.09	0.20	0.09	0.28	0.09
Undergraduate	0.13	0.10	0.16	0.09	0.16	0.08
PG Diploma	0.03	0.07	0.03	0.06	0.02	0.03
Diploma	0.02	0.05	0.05	0.05	0.14	0.03
Certificate	0.01	0.01	0.09	0.02	0.23	0.07
Integrated	0.37	0.34	0.27	0.37	0.25	0.33
Total	0.13	0.09	0.15	0.09	0.17	0.08

Source: computed using AISHE annual reports data

Table 4: Gender Parity in IHE

Course	2011-12	2014-15	2018-19
Ph.D	0.66	0.48	0.57
M.Phil	0.84	0.86	0.33
Post Graduate	0.41	0.50	0.41
Undergraduate	0.65	0.54	0.46
PG Diploma	1.21	1.18	1.17
Diploma	1.43	0.42	0.09
Certificate	1.13	0.21	0.35
Integrated	0.53	0.75	0.95
Total	0.61	0.53	0.43

Source: computed using AISHE annual data

Academic and Research Collaboration, Institutions of Eminence have focused on tapping the talent pool of foreign competitive-academics. The draft National Education policy 2019 vis-a-vis the previous policies on education clearly reflects India's strategic intentions that aim to facilitate student and faculty mobility, to build international partnerships for research, cross-border delivery of higher education and ease the enrolling processes for IS.

As nations around the world have emphasised on promoting internationalisation of education for common good of all, ensuring equal access to IHE and provision of equal opportunities can be a milestone

in bringing women at par with their counter parts globally. Given the fact that the increased inbound mobility of IS in India is credited to a higher share of male enrolments there is a need of preparative policy deliberations to address convergence of this gap. Unfortunately, over the years the gender gap is worsening instead of improving. This trend is more pronounced in research and higher order programmes of study. Recent years have also seen a widening gap in UG level programmes which is the most prominent segment of IS enrolments. As India envisages to emerge as a 'knowledge superpower' and the 'skill capital of the world' attracting global talent towards research and short term skills training in an inclusive fashion can help India to be identified as a country of inclusive International HE. Various ways of direct reservation, financial support, women specific campus facilities, women oriented curricular inputs and extra-curricular environment, safety measures need to find an important place in policy formulation and program initiation, which seem to be lacking. There is every possibility of these parity measures getting worsened under the impact of the current pandemic which would have a long term effect of triggering unequal opportunities for women as the world gets ready to bounce back. These may have undesirous far reaching consequences of sowing the seeds of gender fractured societies if proper attention is not given to address the existing gender gaps.

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Nanak's Philosophy and Humanistic Teaching for Systematizing All Truths

A B Bhattacharya*

Guru Nanak emerged as a reformer in Indian soil to bridge the gap of different religions; for establishing universal peace through his philosophy of fraternity, equality and common brotherhood; to eliminate the retrograde elements of the religions. The paper explores his philosophical thoughts and teachings which might be included as a teacher education program. JIS University at Kolkata has a Centre of Spiritual Studies following the model of Guru Nanak for interreligious harmony and universal peace.

Guru Nanak's period of the 15th Century India was the time of political, religious and cultural turmoil. Hinduism, Buddhism, Jainism and Islam had become widely degenerated, losing their glory and purity. The Vedas were unintelligible and replaced by *tantric* literature. Castes had split into a number of sub-castes. An almost identical situation was the state of affairs in Islam. Cultural and political conditions were extremely worse. The achievement of Guru Nanak was not only to dam the moral and spiritual energy but also to divert it into the world in a manner to enrich the social, moral and the political life of man. This complicated task was undertaken by Guru Nanak with confidence and determination which could only be prophetic. He fully dedicated his life for promoting harmony among the people of many faiths. Nanak from his early age started to search for the real meaning of life. He attempted to bridge the gap of his followers of different religions. His philosophy can be considered as the model to establish universal peace, eliminating communal conflicts. This is undoubtedly a gigantic task which Nanak wanted to accomplish throughout his life [1].

JIS University at Kolkata has a Centre of Spiritual Studies. It was founded in January, 2016 and formally inaugurated on February 8, 2019. It is administered by a managing board. For the time being, the centre has four different wings, viz. [A] Department of Gurbani Sangeet comprising Classical, Vocal and Instrumental sections, [B] Educational Initiatives, under the Department of Education, that comprises Sikh history, study of religions from perspective of life skill, Punjabi language and Fine Arts, [C] Spiritual study centre comprises library and research reading room, online value education for life skill and personality development, seminars, symposiums and lectures on divinity, publication and distribution and also celebrations of events [D] Public domain works which are mainly associated with Museum, Mobile exhibition, Mobile health check up etc. The purpose of the paper is to explore his philosophical thought and teachings which may help to guide towards a pluralist society. The paper has also attempted to explore the teachings of Guru Nanak and to focus how his teachings can be utilized as a model for interreligious harmony.

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Essence of Nanak's Philosophy

The word 'Philosophy' essentially implies 'love of wisdom' or pursuit of knowledge in any branch of any subject. In the early days study of any branch going up to the grass roots was popularly called philosophy. When men were at the very early stage of their intellectual development they could not differentiate one subject from the other of the universe and had no clear idea about the role of different subjects. In course of time with the development of knowledge and understanding people were able to distinguish different branches of sciences and regarded philosophy as the key of all knowledge of the eternal nature. Initially philosophy was not sharply distinguished from special sciences but later on philosophy, in restricted sense, essentially means neither the study of any particular branch of the universe, nor the knowledge of the eternal nature of things. It is considered as the highest branch of knowledge to systematize all truths and thereafter to arrive at a rational conception of the total reality in eternal and temporal aspects and hence criticizing life and experience. Philosophy is defined in a broad sense as the science and criticism of cognition. Alternately it is considered as the science of knowledge. Philosophers prefer to give emphasis distinctly on the three areas and accordingly philosophy is broadly divided into three distinct parts, viz., epistemology, ontology and axiology, Epistemology is related to the theory of knowledge, ontology is concerned with the theory of reality while axiology maintains the theory of values. Out of the three categories, ontology in true sense deals with life,

mind, matter and God; with essences and qualities and activities. According to Plato, "Philosophy aims at the knowledge of the eternal, of the essential nature of things." Aristotle, on the other hand said, "Philosophy is the science which investigates the nature of being as it is in itself and the attributes which belong to it in virtue of its own nature." This definition largely removes the drawbacks of Plato's definition though it identifies philosophy with metaphysics or ontology. However, it does not accept epistemology or axiology as a part of philosophy. It is important to note that the tendency of contemporary philosophy in true sense is more scientific than metaphysical. Different definitions of philosophy identify the subject as completely unified scientific knowledge when sciences are marked as partially unified knowledge. In a true sense, philosophy has the major role to systematize, organize and unite a subject completely into a unified system. Furthermore, sciences hover mainly on the surface of reality keeping an unexplained residue like intellectual, moral, aesthetic and religious values and so concerned with facts, events, or phenomena only while philosophy goes beyond facts and to interrelate the reality.

Guru Nanak from his very boyhood attempted to propagate Truth and Truth alone with the Philosophy of 'Worship of One God *sans* idols', 'Unity of God', 'Fatherhood of God', 'Equality of Man', 'Inner autonomy', 'Brotherhood of beings' and 'Meaninglessness of ritualism.' He exhorted the people for forgetting all barriers of religion, caste creed, region and color. He was able to restore their faith and undivided loyalty to one God as the only source of all creation. His philosophy can be marked as that of love for Almighty and His creation. Fraternity, equality and common brotherhood remain at the background to maintain the spirit [2]. Its practical importance can be observed in '*Naam Simran*', congregation and sharing of food among the surroundings on a common platform, the so called 'sangat-pangat', 'service to the society', sharing the earning and recitation of God's Name. The guideline provided by Guru Nanak has universal application and so should be accepted universally for the bright future of the future generations.

Nanak's Religious Thought Comprising of the Noblest Principles

It appears from the analysis, in general, that both 'Sufism' and 'Bhakti' contributed largely for the proper development of Nanak's religious philosophy. His teachings were mainly composite by nature comprising mainly the noblest principles of Hinduism and Islam. At the time of comparative study he carefully eliminated the retrograde elements of both the religions. Many miraculous stories are well known about the astonishing wisdom of Nanak from his very childhood. Owing to his indifference to worldly affairs he left royal service and started to mix with saints and sages freely, and finally at the age of thirty he left home and led the life of an ascetic. He then got opportunity to wander at different holy places for gathering spiritual knowledge. After sometime he returned to set up his hermitage at Kartarpur on the bank of the river Ravi for preaching his own philosophy. He, in fact, became a preacher but also led the life of a householder. Nanak composed hymns which he sang with a musical instrument '*rabab*'. He played a very vital role in the 'Bhakti' movement of medieval India. According to Nanak, God is one and formless but Almighty and Omnipresent; merciful to all, even to the sinner. One can attain the grace of God through devotion, love and purity of heart. He considered God as the creator, sustainer and destroyer of the Universe [3].

Nanak considered the importance of the presence of a soul in every human being. Any good action of a person assists to merge with the Eternal soul that is God while evil actions enhance the burden of sin for which the soul remains in darkness. On the basis of this concept he pointed out that each individual must be virtuous for acquiring the eternal liberation from the bondage of the world. Primarily, teachings of Nanak are rested on two themes: (i) praise of virtues and (ii) condemnation of vices. In a true sense, moral conduct and priority on moral values constituted the foundation of his fundamental teachings. Similar to other Sufi saints Nanak was also in favor to accept a *guru* who would guide the individual in all circumstances. Once he said, "Without *Guru*, nobody can attain God. Under the *Guru's* instruction, God's word is heard and knowledge is acquired." He strongly advocated the presence of a *guru* for every man for developing spiritual emancipation. As he was very practical in his outlook, he attempted to end the conflict among different religions. As a first step of it, he rejected the caste system and authority of the Vedas and the Quran as well as idolatry or image-worship. Instead of giving any importance on renunciation of the world, he gave priority for upholding moral values rejecting religious falsehood, hypocrisy, selfishness and violence.

Nanak's vision and mission were carried on by nine successors who did a dedicated work after his death, almost a century time. All his teachings were placed in the '*Adi Granth*' which was compiled by the fifth *Guru* (Arjun Das). During the time of later *Gurus*, the followers of Nanak were called Sikhs, a religious unit. The last Guru (Gobind Singh) transformed Sikhism into a military mission owing to religious prosecution by Aurangzeb, the Mughal emperor. Nanak's main target was to make a religious harmony and peaceful co-existence and not to start a separate religion.

Teachings

The great advocate of humanism, Nanak may be considered as the model of interreligious harmony among the people of different faiths. Unlike common people, Nanak from his very boyhood searched for the true meaning of life. He started to think a way to bridge the gaps among the followers of different religions. His teachings can be designated as a very valuable model to establish universal peace, eliminating communal and other type of conflicts. Some of his important teachings for improving the interreligious harmony are presented in Table 1.

Table 1 Important Teachings of Guru Nanak for Improving the Inter-religious Harmony

- *Your Name alone, Lord, saves the world. This is my hope; this is my support (SGGS. 24)*
- *Truth is higher than everything, but higher still is truthful living (SGGS. 62-11)*
- *Sweetness and humility, O Nanak, are the essence of virtue and goodness. (SGGS. 470-13)*
- *One who works for what he eats, and gives some of what he has O Nanak, he knows the Path (SGGS 1245)*
- *Falsehood will come to an end, O Nanak, and Truth will prevail in the end (SGGS 953)*
- *Blessed is that scribe, O Nanak, who writes the True Name, and enshrines it within his heart (SGGS, 636-17)*
- *Do not call anyone bad; read these words, and understand. Don't argue with fools (Raag Asa, Guru Nanak, 473-13)*
- *Beholding His wonders, I am wonder-struck. O Nanak, those who understand this are blessed with perfect destiny (Raag Asa, Guru Nanak. 464-4)*
- *O Nanak, speaking insipid words, the body and mind become insipid (SGGS 473)*
- *O Nanak, that body is of no use at all, if it does not enshrine the Name of the True Lord (SGGS. 730-9)*
- *Without the True Name, of what use is the frontal mark of the Hindus, or their sacred thread? (SGGS, 467-6)*
- *Contemplate and reflect upon knowledge: you will be a benefactor (SGGS. 356-14)*

Model of Interreligious Harmony

At the time and environment when the entire religion-cultural sector badly needed the rise of a spiritual leader and civil rights worker, Guru Nanak emerged as a new reformer in Indian soil. In early life Nanak observed with his great pain the inhumanity caused by Hindu Caste system, the enmity between the Hindus and Muslims as well as a number of social problems which had continuously upset him. From his childhood, he attempted to prepare a roadmap of the solution of the communal conflicts in addition to other religious and social problems [4]. Guru Nanak explained the situation in this manner: "Kings are butchers. Religion hath taken wings and flown… Modesty and religion have disappeared because falsehood reigns supreme [5]."

After more than five hundred years from Guru Nanak's time, even today the world is experiencing conflicts of the people of different religion as most of the time people of different faiths are not ready to accept people of other religions. In fact, there is no religion which does not promote religious harmony and peace but proper teachings of these religions have been contaminated by the fanatics who never try to get knowledge about their own religions properly [6]. A careful study of the philosophy of Guru Nanak is more important today for promoting world peace by removing all types of misunderstandings among us.

Nanak got his first mystic experience once at the time of his ritual bath in a river. This is popularly known as 'communion with God' where God offered him a cup of nectar to drink and charged him with a mission using the following words: "Nanak, I am with thee. Through thee my name will be magnified. …. Go into the world to pray and teach mankind how to pray. Be not sullied by the ways of the world. Let your life be one of praise of the word (*nam*), charity (*dan*), ablution (*isnan*), service (*seva*), and prayer (simran). I give thee my pledge; Let this be thy life's mission [7]." After the incident Guru Nanak, with his great pleasure, recited as given in Table 2.

After the incident, Guru Nanak visited many parts of India like Assam, Mathura, Banaras, Gaya and also a major part of Pakistan as well as some parts of present Bangladesh. He also started to roam Arabia, Baghdad, Srilanka, Nepal and Afghanistan to preach his teachings and disseminating his ideas. At the time of his visit Muslim Mardana and Hindu Bhai Bala accompanied him [1, 8]. As Nanak was a great

Table 2 Guru Nanak's Recitation after 'Communion with God'

"There is one God. He is the supreme truth.
He the creator,
Is without fear and without hate.
He, the omnipresent pervades the universe.
He is not born
Nor does He die lo be born gain.
By his grace shah thou worship him.
Before time itself
There was truth.
When time began to run its course
He was the truth.
Even now, he is the truth
And evermore shall truth prevail."

advocate of monotheism, he declared that God cannot be confined within any Limit of birth and rebirth. He rejected the idea of idol worship since people used to worship the idol instead of thinking it a symbol. He clearly pointed out that a man-made idol can never be God, as God is infinite and so cannot be defined by human words. The main feature of Guru Nanak's universal philosophy is: 'God does not belong to any particular nation, rather He is for all. That is why human being is one [9].'' Guru Nanak always gave priority upon the word and the recitation of the name of God which he considered essential for everybody. When asked Nanak regarding his own Guru, he replied, "The word is my Guru" and he was anointed by God. He explained clearly that there are two types of names, viz., (i) attributive names of God depicting his power, mercy or other qualities and (ii) True name or '*satnama*', the comprehensive name of God.

Nanak suggested that one can purify the soul reciting the names of God. '*Naam*' is known as the central theme of Guru Grantham Sahib and it is taken as the cure of all sufferings and accepted as the source of everything both physical and spiritual. Nanak pointed out that reciting the names anyone can conquer his own ego, the greatest devil and the principal obstacle for attaining salvation. He clearly mentioned that there is no alternative way to remove egoistic attitude without reciting the God. When a person can win over ego, he can automatically win over anger, greed, lust, attachments and pride which are all originated from ego [10]. Guru Nanak said, every human being is equal and none should be judged due to difference of religion. He regarded the Prophet Muhammad of Islam in this way: "I have seen the light of Muhammad (with my mind's eye). I have seen the Prophet and the messenger of God. In other words, I have understood his message or imbibed his spirit. After contemplating the glory of God, my ego was completely eliminated." He had a deep respect for all the religious texts of different religions like the Vedas or the Bible [11]. He told to the Christians and the Muslims that it insufficient to read the Bible and the Quran only to the lines, rather they have to give sincere effort to understand the teachings of the Quran and the Bible in their hearts and thereby to restraint all their sensory organs. He further advised them: "Practise within your heart the teachings of the Quran and the Bible; restrain the ten sensory organs for straining into evil. Tie up the demons of desire and restore faith, charity and contentment, and you shall be acceptable [12]." Guru Nanak claimed him a teacher of the humanity and not a prophet and he preferred to install '*Naam*' in the mind of the devotee [13]. A *guru* has an important role to help a devotee for understanding the way of salvation and to call God. God shows the divine light to a person through the Gurus. The Mughal Badshah Akbar when visited one of the *Guru Dwaras* in Punjab he was treated like a common man; was not given any precious plate for serving food and also was given an ordinary floor mat to sit. Badshah Akbar understood that these teachings of equality by Guru Nanak can develop unity in the society, enhancing happiness and peace among the people. When Akbar with his great pleasure requested the Sikhs asking any assistance from, they demanded a small plot of land. Akbar with his satisfaction for their activity gave them five hundred Big has of land where Amritsar city and the Golden Temple were founded later on. It is important to note that the Golden Temple was inaugurated by a Muslim Pir, named Mir Mia [14]. There is one more historical incident associated with Guru Nanak which is relevant to discuss at this point. One day Guru Nanak was invited by Malik Bhago to a big feast and also another invitation arranged by a lower caste poor Hindu. After attending the second invitation, he took some food and went to the house of Malik Bhago and took some food from the programme of the rich man. He stood there in front of everyone and applied pressure using his hand. The people present there noticed with a great surprise that blood was coming out from the food of the rich while milk is flowing from the food of the lower caste Hindu. The outcome of the incident was explained considering two significant points: (i) everyone is equal in the society and (ii) the unrighteous earning is very harmful and strictly to be avoided [15]. Guru Nanak spoke that there is no alternative way to escape from the works of world. According to him only through good deeds one can attain salvation and reach God [16]

Nanak as a revolutionary always condemned the corrupt and evil practices and superstitions. Presently, we all are in a global village where due to fast technological advancement have great opportunity to help each other staying at home. This is the appropriate time to realize the teachings of Guru Nanak, particularly to maintain the interreligious harmony among the people paying proper respect to humanity irrespective of Hindu, Muslim, Christian, Jew or any other religion of the world.

Impact of the Philosophy and its Universal Acceptance

Philosophy of Nanak was universally accepted as it proved extremely effective for all the religions. Implementing the concept of Guru Nanak a wave started throughout the country narrowing the gaps between community to community. Resultants the moral degradation halted to of large extnt. The numbers of Guru Nanak's follower increased regularly and presently it is 140 million in the world according to a study [15]. Many of them like Nirankaris, Radhaswamis, Sikligars, Banjaras, Sindhis, Nanakpanthis, Satnamis, Joharis, Karmapa and Nyingmapa as well as Lamas Quresh and Budhu tribes may not stand according to the terminology of a Sikh. But it is a fact that all of them remain the followers of Guru Nanak. Since after Guru Nanak about 10 generations have passed, it is easy to assume that his followers has been around 1000 million so far which has been in a continuous progression. Successively, the nine Gurus were so enmeshed into the teaching of Guru Nanak that the philosophy set by Guru Nanak is strictly being followed as a continuous process over the centuries without differentiating themselves from Guru Nanak with their names and recorded themselves as a connective number of body, e.g., mahla 5 means Guru Arjan the fifth body of Guru Nanak's Jyoti or soul. This continuous process of transfer of Jyoti was rigidly enshrined in Sri Guru Granth Sahib by the 10th Master. It is a fact that the real essence of the overall philosophy as boldly propagated by Guru Nanak is recorded in a very systematic way in Sri Guru Granth Sahib which has been followed regularly till date among all the Sikhs. The essence of Sri Guru Granth Sahib exponentially developed maintaining "Ik Onkar" as the fulcrum and philosophy of '*Japuji*'. Due to very simple communication technique of Guru Nanak, his message immediately went home in all the minds of all the people and at all the time. His every word is fully accepted by his followers as gospel truth which contributed to spread his message over the entire globe in one form or the other.

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National Education Policy –2020: An Overview

K Praveena*

National Education Policy-2020 (NEP) is drafted with a long-term vision of making India a Global Knowledge Superpower with a focus on inclusiveness, participation and holistic approach NEP, 2020 is third in series since independence; the first two were introduced in 1968 and 1986, respectively.

The Indian government replaced a 34-year-old National Policy on Education, framed in 1986, with the New Education Policy of 2020. National Education Policy has been approved after a long brainstorming session with millions of suggestions and after 3-4 years of extensive deliberations. It is based on the pillars of Access, Equity, Quality, Affordability, and Accountability

The draft of the new National Education Policy was submitted by the panel headed by the former ISRO Chief, Padma Vibhushan Professor K. Kasturirangan in December, 2018.

The National Education Policy, 2020 aims to shift towards more scientific approach to education. It will help to cater to the abilities of children in different stages of development. This includes cognitive development, social and physical development. The aspirational policy shares ideas to revamp education, teaching and assessment systems in schools, colleges as well as teacher's and professional-level training. When implemented, the policy will bring India at par with leading countries of the world.

The policy has raised public spending on education by the states to 6 per cent of GDP. Currently, India spends 4.6 per cent of its total GDP on education the major highlights of the policy are presenting here.

School Education

The new policy aims for universalisation of education from pre-school to secondary level with 100 per cent Gross Enrolment Ratio (GER) in school education by 2030. Curriculum, pedagogy and learning should be holistic, integrated, inclusive, enjoyable, and engaging.

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With an emphasis on Early Childhood Care and Education (ECCE), the 10+2 structure of school curriculum is to be replaced by a 5+3+3+4 curricular structure corresponding to ages 3-8, 8-11, 11-14, and 14-18 years, respectively Now the school structure has been divided into four parts. 3-8 age group is further divided into 2 groups 3-6 & 6 -8. In 3-6 years early childhood care will be given importance. Age 6-8 years grade 1-2 called as foundation stage. Age 8 -11years grade 3-5 called as preparatory stage**.** Age 11-14 years grade 6-8 called as middle stage.

Vocational education will start in schools from the 6th grade, and will include internships and exams will be held only for 3rd, 5th and 8th grade which will test achievement of basic learning outcomes, and application of knowledge in real-life situations. The Grade 3 examination, in particular, would test basic literacy, numeracy, and other foundational skills.

Age 14-18 years grade 9-12 called is secondary stage in which assessment will shift to formative style which includes high order thinking skills, critical thinking, and conceptual clarity.

Infrastructure

Adequate and safe infrastructure, including working toilets, clean drinking water, clean and attractive spaces conducive to learning, electricity, computing devices, and internet, library and sports and recreational resources will be important to provide to all schools in order to ensure that teachers and students including children of all genders and children with disabilities, receive a safe, non-violent, inclusive and effective learning environment and are comfortable and inspired to teach and learn in their schools.

Board Examination

The class 10 and 12 examinations- referred to as board examinations - are likely to be held in two difficulty levels and students will be given a second chance at boards to improve their score. They will be free to take up courses regardless of the stream division of arts, commerce and science

Board examinations will be made 'easier', as they will test primarily core capacities and

competencies rather than months of coaching and memorisation.

Board may, over time, also develop further viable models of Board examinations, such as – annual/semester/modular Board examinations; offering all subjects beginning with mathematics, at two levels; two parts examinations or objective type and descriptive type.

Progress Cards

The progress card will be a holistic, 360-degree, multidimensional report that reflects in great detail the progress and the uniqueness of each learner in the cognitive, affective, and psychomotor domains. The progress card will include self-assessment, peer assessment and teacher assessment.

Medium of Instruction

Up to grade 5 mother tongue will be the medium of instruction The NEP puts focus on students' mother tongue as the medium of instruction even as it sticks to the 'three language formula' but also mandates that no language would be imposed on anyone. The NEP only recommends the mother tongue as medium of instruction, and not make it compulsory.

Continuous Professional Development for Teachers

Teachers will be given constant opportunities for self-improvement and to learn the latest innovations and advances in their profession.

Platforms (especially online platforms) will be developed so that teachers may share ideas and best practices. Each teacher will be expected to participate in, say, 50 hours of CPD opportunities every year for their own professional development, driven by their own needs and choice. CPD opportunities will, in particular, systematically cover the latest pedagogies regarding foundational literacy and numeracy, formative and adaptive assessment of learning outcomes, individualised and competency- and related pedagogies, such as experiential learning, arts-integrated, sports integrated, and storytelling-based approaches, etc.

Higher Education

NEP, 2020 aims to increase the Gross Enrolment Ratio in higher education including vocational education from 26.3 per cent in 2018 to 50 per cent by 2035 and aims to add 3.5 crore new seats to higher education institutions.

Common Entrance Examinations for Admissions to Higher Education

From school to colleges, it is advised that there should be a single gateway. The National Testing Agency (NTA) will conduct a Common Entrance Examination (CEE) for admissions to universities across the country. A common aptitude test, as well as specialised common subject exams in the sciences, humanities, languages, arts, and vocational subjects, will be held at least twice every year. It will allow "most universities to use these common entrance exams – rather than having hundreds of universities each devising their own entrance exams, thereby drastically reducing the burden on students, universities and colleges," the NEP read. It will not be mandatory and will be left to individual universities and colleges to use NTA assessments for their admissions. The National Scholarship Portal will be expanded to track the progress of students receiving scholarships.

No Separate Governing Bodies for Higher Education

Higher Education Commission of India (HECI) will be set up as a single overarching umbrella body for entire higher education, excluding medical and legal education. Public and private higher education institutions will be governed by the same set of norms for regulation, accreditation and academic standards.

Rationalised Institutional Architecture

The definition of the university will allow a spectrum of institutions that range from Research-intensive universities to teaching-intensive universities and autonomous degree-granting colleges. Affiliation of colleges is to be phased out in 15 years and a stage-wise mechanism is to be established for granting graded autonomy to colleges. Over a period of time, it is envisaged that every college would develop into either an autonomous degree-granting college, or a constituent college of a university.

Diminishing Compartmentalisation between Disciplines

Under NEP–2020, there will be no rigid separations between disciplines like arts, sciences, commerce etc; between curricular and extra-curricular

activities, between vocational and academic streams. Students can select subjects of their liking across the streams.

Multidisciple Entry and Exit

Students can follow their passion through multidisciplinary course through multiple entry and exit.

Under the NEP, undergraduate degree will be of either 3 or 4-year duration with multiple exit options within this period. College will be mandated to give certificate after completing 1 year in a discipline or field including vocational and professional areas, a diploma after 2 years of study, or a Bachelor's degree after a 3-year.

The four-year programme may also lead to a degree 'with Research' if the student completes a rigorous research project in their major area(s) of study programme.

Government will also establish an Academic Bank of Credit (ABC) for digitally storing academic credits earned from different HEIs. So that these can be transferred and counted towards final degree earned.

Promotes Digital Learning

In a bid to ramp up digital learning, a National Educational Technology Forum (NETF) would be created. "E-courses will be developed in eight regional languages initially and virtual labs will be developed." It will be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration and so on, both for school and higher education.

A rich variety of educational software will be developed and made available for students and teachers at all levels. All such software will be available in all major Indian languages and will be accessible to a wide range of users including students in remote areas and with disabilities. Teaching-learning e-content will continue to be developed by all States in all regional languages.

MERUS

Institutions called Multidisciplinary Education and Research Universities (MERUs) are to be set up at par with IITs and IIMs. National Research Foundation is to be created as the apex body to foster strong research culture across higher education.

Under the policy, National Assessment Centre called 'PARAKH- Performance review and analysis of knowledge for holistic development' has been created. The center will assess the students.

Top 100 colleges of the world will be allowed to set their campuses in India. Foreign universities will be given special dispensation regarding regulatory, governance, and content norms on par with other autonomous institutions of India.

Promoting High-quality Research

Research and innovation at institutions in India, particularly those that are engaged in higher education, is critical. Evidence from the world's best universities throughout history shows that the best teaching and learning processes at the higher education level occur in environments where there is also a strong culture of research and knowledge creation; conversely, much of the very best research in the world has occurred in multidisciplinary university settings.

Research and Innovation (R&I) investment in India has been only 0.69 per cent of GDP. For the sake of comparison, the levels of R&I investment as a proportion of GDP in some other countries are: United States (2.8 per cent), China (2.1 per cent), Israel (4.3 per cent), and South Korea (4.2 per cent); i.e., all invest at least three times as much as a proportion of GDP.

In order to focus on research and promote research culture in all HEIs in an interrelated and coordinated fashion, there shall be a National Research Foundation (NRF) which would bring a quantum jump in funding and support for research.

The NRF will competitively fund research in all disciplines across the academic landscape: Science, Technology, Social Sciences, and Arts and Humanities. Successful research will be recognised, and where relevant, implemented through close linkages with governmental agencies as well as with industry and private/philanthropic organisations.

Teacher Student Ratio

The teacher-student ratio shall range from 1:10 to 1:20 depending on the programme. The teaching duties shall allow time for interaction with the students, conducting research, and other university activities. Faculty will be appointed to individual institutions and not be transferable across institutions, so that they may feel truly invested in,

connected to, and committed to their institution and community.

Promotion of Indian Arts and Culture

The promotion of Indian arts and culture is important not only for the nation but also for the individual. Cultural awareness and expression are among the major competencies considered important to develop in children, in order to provide them with a sense of identity, belonging, as well as an appreciation of other cultures and identities. It is through the development of a strong sense and knowledge of their own cultural history, arts, languages, and traditions that children can build a positive cultural identity and self-esteem. Thus, cultural awareness and expression are important contributors both to the individual as well as societal well-being.

Time for Implementation

Any policy is only as good as its implementation. Such implementation will require multiple initiatives and actions, which will have to be taken by multiple bodies in a synchronised and systematic manner.

The policy recommends the creation of a Rashtriya Shiksha Aayog (RSA), an apex advisory body for elementary to university education in India duly replacing the Central Advisory Board of Education (CABE).

The RSA shall be responsible for developing, articulating, evaluating, and revising the vision of education in the country on a continuous and sustained basis, in close collaboration with the corresponding apex bodies of States. It shall also create and continuously review the institutional frameworks that shall help attain this vision a Rajya Shiksha Aayog (RjSA) may be constituted in each State, headed by the education minister of the state with other members.

By 2030, the minimum degree qualification for teaching will be a 4-year integrated B.Ed. degree.

Starting with the change in the name of the Ministry of Human Resource Development into the Ministry of Education, the policy will be implemented immediately in phases.

There are over 100 action points in the Policy. Implementation will be done in phases, based on time, region and types of institutions with Institutes of Eminence (IoEs) and Central Universities taking the lead.

For instance, four-year undergraduate degrees with multiple entry-exit options will be introduced in the 20 IoEs from the 2020-21 academic year, while others continue with the existing three-year degree courses. Existing M.Phil students can continue until they complete their degree, although new admissions for the programme will not be accepted.

The National Testing Agency will introduce a pilot version of the common entrance test by December 2020, which will be used for admission to all IoEs and central universities in 2021.

Some Indian Institutes of Technology are working on developing the technical structure of the Academic Credit Bank, which will also be established by December, and become applicable to all new students joining central universities next year.

The National Foundational Literacy and Numeracy Mission which is to be implemented by 2025 will be launched by the end of this year. The National Council of Educational Research and Training (NCERT) will introduce the curricular framework for the new school structure, including early childhood care, by the next academic year.

Free breakfasts can only be considered in the next academic year if a budget allocation is made to cover it.

The process of converting affiliated colleges into degree granting autonomous institutions and then further into fully fledged universities is estimated to take at least 15 years, as the Centre will have to provide financial assistance for this purpose.

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Development Paradigms and Transitions: Contours of the Journey of Independent India

Vijay Kelkar, Chairman, National Institute of Public Finance and Policy, New Delhi delivered the Convocation Address at the 101st Convocation of Banaras Hindu University, Varanasi on December 23, 2019. He said, "We have to look beyond small moves to the evolving Idea of India. In India today, we are all impatiently running from one tweet to the next. We don't have the time to cogitate about where we have been. But we must tell each other stories about the journey that we have been on, so that we may understand our journey better, and bring greater wisdom to the next fork on the road. We all need to understand that since our independence our fellow citizens have been involved with one of the unique and perhaps the greatest development enterprise of the humankind. It is unique because our millions of citizens embarked on achieving multiple transitions simultaneously where other advanced nations did it sequentially and this was spread over a long period of a few centuries." Excerpts

I come here from Pune which, like Banaras, is also considered as the City of Learning. Of course, I am very mindful that in richness the heritage of Banaras is far greater than that of Pune. In our country, for centuries, Banaras has been a *'Punyabhoomi'* for its great achievements in both the secular and the sacred. In the fields of literature, arts, music and the profound philosophical explorations of the cosmos, the achievements here have been phenomenal. There is no place anywhere in the world that can possibly rival Banaras. It is in this land the venerable Gautam Buddha delivered his first sermon and uttered his noble Truths for the upliftment of the humanity. It is here the great Saint Kabir rendered his beautiful poetry imbued with love and deep human values, and who can ever forget the stunning philosophical reflections such as *Manisha Panchakam* by the great *Adi Shankaracharya* during his sojourn in this City.

So to make a pilgrimage to Banaras is indeed a dream come true for someone like me from Pune. Indeed, I am delighted to be at this unique temple of learning built by the legendary Mahamana Pandit Madan Mohan Malaviyaji with patriotic fervor and full of dreams for our great country. On this day of important Celebrations, I extend my warm congratulations to the all graduating students for their academic achievements and to their proud parents who have sacrificed so much for this grand success of their wards.

Today I want to share with you my reflections on our country's journey towards what our first Prime Minister Pandit Jawaharlal Nehru so eloquently expressed in his mid-night speech on 15th August 1947 as our "Tryst with Destiny." To my mind, this "Tryst with Destiny" meant wiping out the curse of poverty from our land and make our nation a prosperous and liberal Republic and thus contribute handsomely our due share to the wellbeing of every nation and to the advancement of global peace.

These days, one hears a great deal about the possible danger of India getting into "Middle Income Trap." What is this Middle Income Trap? Scholars of economic development have categorized countries as Poor Countries, Middle Income Countries and High Income Countries. Internationally accepted norms for these three categories are that the countries with less than 1000 USD per capita income are Poor Countries, while the countries between 1000 and 10,000 USD per capita income are considered as Middle Income countries and after you cross 20,000 USD per capita income, countries are considered as a Member of the Elite Group of High Income Countries. Now, the experience of the last 200 years or so is that it is easier for a country to make transition from a poor to the middle income category just like with our present level of 3000 USD per capita income India has done such a transition. However, the transition from the middle income category to a high income country has been elusive to many many countries. The most prominent examples of the countries who seemed to be trapped in Middle Income Level are from Latin America, Caribbean, and East Europe. Closer home, in Asia, Japan and Korea are the only two countries that have become High Income countries and other countries from our continent are still in the Middle Income Category. What about our country? How we should ensure that we achieve the transition to a high income prosperous nation and thus redeem our freedom fighters generation's pledge.

In the early years of our independence at a time when we were fresh from the excitement of the freedom movement, where the Indian National Congress challenged the world's most powerful empire and won. Our countrymen were all full of hope about what was going to happen and today I would like to narrate important contours of our journey of the post-independence years.

Our Mahayajna (on महायज्ञ)

And in this narration, we will step away from the day to day news flow, and think about the big ideas that matter. We have to look beyond small moves to the evolving Idea of India. In India today, we are all impatiently running from one tweet to the next. We don't have the time to cogitate about where we have been. But we must tell each other stories about the journey that we have been on, so that we may understand our journey better, and bring greater wisdom to the next fork on the road. We all need to understand that since our independence our fellow citizens have been involved with one of the unique and perhaps the greatest development enterprise of the humankind. It is unique because our millions of citizens embarked on achieving multiple transitions simultaneously where other advanced nations did it sequentially and this was spread over a long period of a few centuries. I cannot tell you how privileged we are that in our life time we are getting an opportunity to be part of this truly "महायज्ञ."

The Audacity of our Founding Fathers

It is hard to even comprehend the India of 100 years ago, where our leaders like Gandhiji, and Nehru got going on building the freedom movement. It was an India of incredible backwardness. To give you one illustration of how things were, here is an astonishing fact: literacy in India in 1920 was 8 per cent. Today we're at about 75 per cent. We know how bad it is, that 25 per cent of India is illiterate. But can you even imagine an India where 92 per cent is illiterate? That was the starting point, where our founding fathers had the nerve to challenge the British, and also ambitions to envisioning what a free India would look like. They wanted India to aspire to be a great and prosperous Democratic Republic. The founding fathers of our republic drew their inspiration from our syncretic civilizational heritage as well as from the French Revolution, American Resolution and the Revolutionary Magna Carta and most importantly from the robust good sense of the people of India.

For 30 years leading up to independence, some of the best minds in India, and from outside the country, thought hard about the nature of government in free India and the needed economic, political and social transformations, all to be achieved simultaneously and not sequentially as done by the West.

The economic transformation involved harnessing the energy of free people to innovate, to compete, and thus create firms inside which high productivity would be obtained. At the time there was a shortage of capital, so they had to also plan out the 'primitive accumulation', the early creation of the capital stock.

The political transformation involved going from power in the hands of a few colonial masters and ICS officers to a liberal democracy, with the dispersion of power across millions of people. Democracy is the institutionalized system of checks and balances, and the rule of law. A liberal democracy involves voting and elections, of course, but it is much more than that. The essence of a liberal democracy is a system of dispersion of power, of pitting interest against interest, of the rule of law. As Fareed Zakaria says, the courts are probably more important to democracy than the elections. One cannot overemphasize the uniqueness of an independent India adopting a system of liberal democracy at its inception even when it was beset with the mass poverty and mass illiteracy. No other country had attempted such a miracle.

The social transformation involved the frontal attack on the mistreatment of our women, the dehumanizing caste system and the profound neglect of *adivasis*. All over India, we needed to set off revolutions of aspirations and individual agency, so that women, the *bahujan* as Dr. Ambedkar described, and *adivasis* would think for themselves and live life on their own terms, without being gripped by traditional or oppressive social mores.

So 100 years ago, our founding fathers started from 8 per cent literacy, and dreamed up a work plan of fighting the mightiest empire in the world, and setting off the economic modernization, the political modernization and the social modernization of India, all at once. Nobody can accuse them of setting their sights too low! The best minds of India set about dreaming about how the Indian state would work, with these perfectly audacious goals.

And the optimism of that moment was overwhelming. Most people in the Congress, at the

eve of independence, were certain that in about two generations, or about 50 years, India would catch up with the advanced countries of Europe. We were completely committed to the goal of achieving levels of freedom and liberal values, prosperity comparable to the then advanced countries within about two generations. Towards this, they adopted what I call the "First Development Paradigm."

The First Development Paradigm

We have to also remember that this was a very difficult time in the world. From 1914 to 1950, there was great economic and political turbulence in the world. Here in India, we faced the violence of Partition, a war in 1948 and the distortions of a colonial economy engaged in a freedom struggle.

This first development paradigm was led by Nehru, Mahalanobis, Pitambar Pant, Prof. Sukhamoy Chakravarty and others. It involved a leadership role for the government in many aspects of society. Gandhiji thought this was a bad idea, and the future proved his hesitations regarding the role of the State rather prescient. But I am going ahead of the story.

This Nehruvian strategy gave the government the "commanding heights" of the economy, with a large public sector, and myriad state initiatives. It was the golden age of our belief in government as being good, of government as being benevolent, of government playing a leadership role in the evolution of the country. The early decade after independence worked rather well, compared with the previous decade. Many good things in India today have come from the wisdom of that period.

But the excessive control and domination by the government worked out poorly. Within less than two decades. This approach led to a license-permit-raid *raj*, and all the problems that go with this. Our relative neglect of agriculture and primary education aggravated these problems. And this set the stage for the dark days of economic and political instability. In succession, we had a series of disasters: the 1962 war with China, Nehru's death in 1964, two consecutive droughts and our living off food sent by the Americans as aid, and bank nationalization in 1969. Despite these dire conditions, Indira Gandhi still won well in the elections of March 1971. Her power was exacerbated by winning the war in December 1971. This concentration of power rapidly gave an economic collapse, and then we had the collapse of personal freedom with the 1975 emergency. By this time, it was very clear, that the First Paradigm had gone dysfunctional and we need a different approach and this led to the adoption of what I call the "Second Paradigm."

It is important to see the long lags in the development and the impact of ideas. The elements of the First Paradigm were built from 1920 to 1947. They worked well for about a decade, and then the cumulative impact of many decisions generated stagnation.

The Second Paradigm

The Second Paradigm was developed by thinkers from the mid 1960s onwards. Critical elements of this were built by the Ph.D. Thesis of Manmohan Singh and many other thinkers such as Arun Shourie, Abid Hussain, Jagdish Bhagwati and T. N. Srinivasan. These thinkers were acutely aware of India rapidly falling behind other dynamic economies of East Asia. These countries achieved great success in exploring export opportunities. For accelerating growth and removal of poverty, our reformers argued in favour of trade liberalization, scaling back the license-permit-raid raj, a flexible exchange rate, and a greater role for the private sector and linking actively with the global economy.

These ideas were put into practice, slowly, from 1977 onwards, with Morarji Desai as PM and changed course in Indian economic policy, gradually and carefully. Trend growth rose from 1979 onwards.

Through the 1980s, the baton was passed to Indira Gandhi and Rajiv Gandhi, who carried forward these ideas. This gave strong growth for some time, but we landed up with a Balance of Payment crisis in the late 1980s. That set the stage for the remarkable policy initiatives and reforms led by P. V. Narasimha Rao, Dr. Manmohan Singh and many others. With his sagacious policies, Prime Minister, Atal Bihari Vajpayee, gave further momentum from 1999 to 2004, kicking off perhaps the greatest growth run in India's history.

From 1991-2011, we got growth of a kind that we have never seen before. The Second Paradigm thus involved thinking from the 1960s onwards, and delivered the growth episode of 1991-2011.

And, then, the Second Paradigm slipped. For some years leading up to 2011, a series of actions came about, which changed the confidence of the private sector. Three kinds of things went wrong.

First, extensive meddling in the economy by the government continued. The Government increased the use of protectionist measures dampening the growth impulses. We also remain beset with micro management of the economy.

Second, these powers of intruding into the economy by the government are wielded with low rule of law. This creates business model risk. A person can build a business, with great effort, but the very business model can be destroyed overnight because the government comes up with some new intervention into the economy, often without warning such as retrospective tax of 2012, which is a classic example of adversely affecting the business confidence.

Third, the investigative agencies have become a serious problem. There is now an alphabet soup of agencies who can come make life difficult for a private person. Big companies have the resources to hire lawyers and accountants and deal with these threats. But for a medium sized company, an income tax raid that leads to Rs.5 to Rs.10 Crore in legal fees can lead to shutting the company down.

These three problems have come together, and changed the risk/reward tradeoff as seen by private persons. As a consequence, dynamism of private investment as well as exports declined. We now see this clearly in many data series. Trend growth went down since 2011.

It is important to see that trend growth did not decline in 2011 owing to actions taken in 2011. Many developments in policy and the economy came together, to a point where the private sector lost heart, and we see a decline in private investment from 2011 onwards.

Reversing of this decline in trend growth is one of the most important challenges facing India. High economic growth is essential for our society. We will fare best on meeting our challenges of the social and political modernization if these are done in the context of high economic growth and this requires a new Third Paradigm for Development.

As an example, a central feature of social modernization is women leaving the home, going to study and work in a new city. Similarly, the essential feature of social modernization is women leaving the home and going out to work every day. This labor force participation of women comes about the best when there is high GDP growth. When growth falters, the women are the first to exit the labor force. In most of North India, women's labor force participation is now comparable to the levels seen in Saudi Arabia. In my view, this is one of the greatest failures of ours in the post-independence period.

Long years ago, we made a tryst with destiny, and we must find our way out of these dark woods.

The Third Paradigm

What will this take? My colleague Ajay Shah and I have recently written a book on this question. This book is called *In Service of the Republic: The Art and Science of Economic Policy*. You must of course go and read the book! But I will preview some of our key ideas here. These ideas are drawn upon the work of many outstanding social scientists, economists and political theorists mainly from India who have been carefully studying developments in India as well as the recent advances in economic science. Our book is an exploration towards identifying the Third Paradigm. Third Paradigm involves a complete transformation of the formulation and implementation of economic policies and also fundamentally to strengthen our Liberal Republic. The foundation of liberal democracy, and prosperity, is individual freedom. We must strengthen the foundations of personal freedom and economic freedom. This requires a substantial reduction of government intervention in the economy.

The technical achievements of the field of public economics have created important knowledge about knowing when there is a need for government intervention. There is a nice and clear concept called "market failure" which guides us on when government intervention can help. In all other situations, no government intervention is required. We in India will do well to remove all these other government interventions.

Suppose market failure is indeed present, and we want government intervention. As an example, consider the air quality crisis in North India. Here, we run into the barrier of state capacity. We may ask a state agency to do something, but most of the time, the Indian state has low capabilities and the required work does not get done well. The central challenge in Indian politics and economics is to grapple with this problem of low state capacity.

The path to state capacity lies in reining in executive discretion. There is too much arbitrary

power in the hands of officials. We need to design laws and government organizations with much greater care, so that coercive power is used sparingly and wisely. Government agencies should have to first prove themselves with high levels of capability and high levels of checks-and-balances, before being given the power to spend or the power to coerce. The income tax department should get British-style powers to raid a person only when we achieve British-style state capacity and rule of law, with strong protections of private persons.

In India today, we are veering towards "the administrative state", which essentially means the rule by officials who possess arbitrary power, and who creep into legislative and judicial functions. We need to push back against this. Laws must be drafted through negotiation in the legislature, and not by the joint secretary. We need a much better functioning judiciary. And the arbitrary power of officials needs to be replaced by a rule of law system with elaborate checks and balances, which give protections to private persons.

These are the key ideas that need to go into the Third Paradigm that our thinkers need now to construct. These are the requirements of India at our present state of development, where a middle income economy has emerged, where weaknesses of the state have created fear in the minds of private persons who have retreated into low investment and consequently to deceleration of productivity growth and national income. Addressing these problems will put us on the path of growth over next few decades and thus will become an advanced and high income economy.

The essential features of the First and the Second Paradigms are principles, and a conceptual framework. Once the framework is understood, there is the practical process of looking at the short term situation and taking practical actions.

In similar fashion, the third wave or policy paradigm is about ideas and principles. The First Paradigm was developed through a process of debate from 1920 to 1947. The Second Paradigm was developed through a process of debate from 1964 to 1977 and then all the way to 1991. In similar fashion, we must embark on a long journey of ideas, to debate the elements of the Third Paradigm, and flesh it out from high ideas into a practical program of action. This is our task in India today.

This Third Paradigm in the Idea of India is not the task of any one discipline. It requires inter-disciplinary work between public economics, law, public administration, political economy and political science. All of us, across these multiple disciplines, have to break heads, and teach each other, in order to understand the problems that we face and solve them.

Dear Friends, I cannot emphasize strongly enough great importance of the concept of liberal India of our founding fathers. This pledge of our founding fathers has to be renewed by every generation because without that multi-cultural, multi-ethnic, multi- lingual land of ours will be unable to fulfill its truly great potential. On this, I hope BHU will not falter but once again become a beacon of hope and enlightenment and thus fulfill the dreams of Mahayana. In present turbulent times, BHU must remember and fulfill its *Dharma*.

I thank you for your attention ❑

International Webinar-cum-Lecture Series on Educational Transformation

A three-day International Webinar-cum Lecture Series on 'Educational Transformation in the Era of COVID-19: Challenges and Issues' was organized by the All India Association for Educational Research (AIAER) and International Forum of Researchers in Education (IFORE) in collaboration with the Institute of Professional Studies College of Education, Gwalior, Madhya Pradesh during October 28-30, 2020. The event was inaugurated by Dr. Arun Kumar Tyagi, Director, IPS Groups of Institutions. Dr. (Mrs) Rama Tyagi, Principal of the College and Co-host introduced the guests. Prof. Rossano André Dal-Farra, Brazil gave the description of the challenges and strategies being implemented to tackle the situation, pointing out how the efforts being made by his nation would not be able to fill up the vacuum in learning spaces created by COVID-19, in near future. It may take a few years to normalize the teaching learning activities. Dr. D K Diwan from Haryana gave the concluding remarks and proposed the vote of thanks.

Dr. Sunil Behari Mohanty, President, All India Association for Educational Research and Co-host of the programme, Dr. Bidyadhar Sa, Teaching Technology Expert in a Medical University in West Indies spoke about educational disruption caused by COVID-19, challenges created by COVID-19 for medical education, mitigation strategies for Medical Education during COVID-19, impact of mitigation strategies and strategies to deal with same and futuristic of Medical Education. He discussed the badly affected medical and paramedical education because this type of education is mainly practical based education, and it is very difficult to maintain the education level in such situation of pandemics. He emphasised on the increased involvement 21st Century learning and teaching tools such as educational and web-conference software as well as simulation experimental software because medical research required clinical data, which is only collected by direct physical examinations. Prof. Pradeep Chouhan, IPS College of Pharmacy, Gwalior concluded the session and proposed the Vote of Thanks.

Prof. (Ms) Sandra Poirier, Nutrition and Food Science Program, Middle Tennessee State University, Murfreesboro, TN, United States discussed the situation caused due to COVID-19 in her country. Also, a new paper estimates that over 2.5 million years of potential life have been lost to COVID-19 in the United States. She spoke about huge loss in learning pathways and traumatic stress inflicted upon the learner community at different stages of education. Issues pointed out by her included exploring strategies to take common teaching strategies online, reaching out to families to check in on student wellbeing, having icebreakers for tackling socio-emotional blockages, making teachers to be real persons, not limiting themselves to assigners of task, creating a detailed study plan in the absence of or in reduced face to face teaching learning opportunities, making leaderships innovative in their approaches, etc. Prof. (Mrs) K Chellamani, Pondicherry University concluded the session and proposed the Vote of Thanks. She highlighted the salient points from the talk and underlined the element of inter-personal interactions out of equations. Evaluating each other's learning and exchanging feedback on performance help students to operate in a co-operative and active environment promoting accountability, kinship, interdependence, and deeper understanding of concepts.

Prof. Beatrice Ávalos-Bevan, Centre for Advanced Research in Education, University of Chile, Santiago, Chile in her deliberation discussed the findings of a study on the impact of COVID-19 over teachers' lives, their teaching and students. Majority of teachers were not in favor to teach in distance form. Prof Beatrice was of the opinion that in Chile, far from remaining aloof or complaining, teachers have been actively working to lower learning gaps among students, they have a professional discourse that includes socio-emotional support and confinement is producing pedagogic innovation and opening the way to change. The efforts provided new knowledge about students and their families and renewed appreciation of school's community support. Prof. Jahitha Begum, Gandhigram Rural Institute, Tamil Nadu concluded the session and proposed the Vote of Thanks.

Prof. V N Rajasekharan Pillai, Vice Chancellor, Somaiya Vidyavihar University and Provost of Somaiya Vidyavihar and Somaiya Ayurvihar under the Somaiya Trust, Mumbai and Chancellor, ICFAI University, Tripura and Former Vice Chancellor, IGNOU, MG University, Kottayam, Kerala and Cochin University of Science and Technology,

Kerala spoke about the disastrous consequences of COVID-19 on the Indian higher education system and discussed about various ongoing efforts and suggested certain strategies to be evolved for tackling the issues. According to him, technology cannot teach, only teachers can teach. Loss of face to face interaction of students with experts got reduced affecting quality of research deliberations. Tackling the pandemic in education system necessitates new norms related to approaches to teaching, definition of work space, working hours of institutions, and professional working groups. There was a greater need for networking among institutions and having cross border networks. Prof. Bhujendra Nath Panda, Dean, Research, Regional Institute of Education (NCERT), Bhubaneswar, Odisha concluded the session and proposed the Vote of Thanks.

During the next session, Prof. Izhar Oplatka, Professor of Educational Administration and Leadership at the School of Education, Tel Aviv University, Israel cited various problems being faced by education system in most of the nations which have been seriously affected by COVID-19. He pointed out various problems in his nation like 30% of the first/second graders don't participate in the lessons, 490,000 students can't connect to the net, unprivileged families can't cover the expanses of printing learning materials, 34% of the parents reported having insufficient computers at home, the effectiveness of learning via Zoom is very limited, rich parents hire special tutors for their kids, a feeling of lost year in education and an increase in latent dropout, especially among disadvantaged population. According to him, it is important to open schools, at least because each day in which the students out of school costs 800,000$. He also suggested various solutions against pandemic. A few initiatives that he proposed for his nation applicable to other affected nations were a massive purchase of new programs for e-teaching, the development of new digital contents, in service training for instructional staff in digital teaching/learning, infrastructure– increasing internet Wi-Fi in schools, a purchase of more computers and lending lap-tops to unprivileged children. He concluded by referring to confusion and uncertainty– main responses to the crisis in education and accompanied fears about the emotional development of young children/ the achievements of the graduates. Prof. Brinda Bazeley Kharbirymbai, Department of Education, North Eastern Hill University, Shillong, Meghalaya concluded the session and proposed Vote of Thanks.

Prof. Ananda Kumar Palaniappan, Faculty of Social Sciences and Humanities, Tunku Abdul Rahman University College, Kuala Lumpur, Selangor, Malaysia and Former Professor of Education, University of Malaysia, Malaysia started his talk with the history of conquest of COVID-19 which had adverse impact on health including mental health, education, economy, social, political and even moral values and ethics. He said that although 90% of Malaysians are technology literate, but most were not prepared for 100% online education. Many rural areas were lacking internet access. Malaysia government provided 1GB free internet through selected telco companies throughout the Movement Control Order. Referring to global scenario, he said that most affected are those from under-privileged families/rural/special needs children. Prolonging the time to graduation places an additional burden on students' finances by increasing both the total cost of an education and the time for the student to begin working. COVID-19 has widened the gap between the rich and the poor. While wealthier communities use more demanding technologies (virtual and mixed reality, telepresence) poorer ones turn to tools with lower infrastructure demands (asynchronous video, audio, images and text). School closures tend to reinforce inequalities. Use of digital means such as Google Meet, Zoom, Webex, Teams and others are helpful to most students, but accessing these cost money. COVID-19 has widened the gap between the rich and the poor. While wealthier communities use more demanding technologies (virtual and mixed reality, telepresence) poorer ones turn to tools with lower infrastructure demands (asynchronous video, audio, images, and text). School closures tend to reinforce inequalities. Use of digital means such as Google Meet, Zoom, Webex, Teams and others are helpful to most students, but accessing these cost monies. To tackle the pandemic created learning loss, teachers explore many varied ways of delivering material and engaging students online by tapping into their own creativity and use break-out sessions in Online Teaching Platforms (OTP)- Organize thinking games / puzzle during on-line classes and points for winners. The pandemic has accelerated the process of digital transformation. Prof. V M Reghu, Thiruvananthapuram, Kerala concluded the session and proposed the Vote of Thanks.

Dr. (Mrs) Rekha B Koul, Dean International, Faculty of Humanities, and Associate Professor,

School of Education, Curtin University, Australia in her presentation gave stress on improving learning environment led to development of tools such as learning environment inventory, my class inventory, classroom environment scale, individualized classroom environment questionnaire, college and university classroom environment inventory, our class and its work, science laboratory environment inventory, questionnaire on teacher interaction, computer assisted learning environments, and constructivist learning environment survey. Dr Koul concluded her talk with the final slide of her presentation that listed success of her university in becoming a leader in online teaching with more than two decades of experience, delivering most successful teacher training programme in fully online mode with up to 12K enrolments per year, remote labs in sciences to simulations in business and health sciences, partnership with EdX produced 30+ MOOC's and in development of challenge a gamified project platform. Systems in use were: Akari, Blackboard, Challenge, Collaborate, Dixon, iLecture, IRIS, SoNIA, Turnitin, Unit Outline Builder. Strategic Projects were: Digital Learning, Teaching Excellence, Learning Analytics, Curriculum Transformation. Concluding remarks and Vote of Thanks were given by Prof. Nil Rattan Roy, Tejpur University, Nappam, Assam.

Dr. Sunil Behari Mohanty discussed about the extent of damage caused by COVID-19 demon in different nations and pointed out the Worldometer statistics of 30th October listing India as a very listed death per million population among nations was highest in San Marino-1,237. Dr. Mohanty suggested that in coming two years all institutions including Anganwadisto function throughout the year and central and state governments need to modify service rules for all categories of teachers to make them get leave as applicable to non-teaching employees of the institutions, etc.

Prof. John Benedicto Krejsler, Danish School of Education, Aarhus University, Denmark and President, Nordic Educational Research Association spoke about the scenario of Danish education system during current pandemic, especially when there has been another wave. He focused on problematization of consequences of disconnect from physical world in favor of digital life. Denmark, Sweden, and the EU reacted with national solutions first, but then afterwards coordinated big bail-out package. He concluded with the statement that digital life although a wonderful and enriching supplement to physical life and encounters…but, is a poor substitution when it takes over and becomes your overwhelming reality and the nations have to digest this truth. Dr. Sunil Behari Mohanty concluded the session and proposed the Vote of Thanks.

Faculty Development Programme

The eight-day Faculty Development Programme on 'Mentoring Pedagogy, Teaching and Application of ICT Tool for Online Classroom Delivery for Teachers' is being organised by the Electronics and ICT Academy, IIT Guwahati, Assam in collaboration with H.P.B. Girls' College, Golaghat, Assam and BN College, Dhubri, Assam during December 07-14, 2020. The faculty members and PhD research scholar may participate in the programme. The objectives of the programme are to learn Google Classroom and to impart training to a level where faculties will be benefitted in terms of the teaching style, personality improvement, classroom delivery and help the faculties to create a strong mentor mentee relation required for overall development.

For further details, contact Project Manager, E and ICT Academy, IIT Guwahati- 781039 (Assam), E-mail: *eictacad@iitg.ac.in, eictacad@gmail.com, eictinfo.iitg@gmail.com*. For updates, log on to*: http://eict.iitg.ac.in/*

Online Short Term Course on Machine Learning for Data Science

A ten-day Online Short Term Course on 'Machine Learning for Data Science using Python' is being organised by the Department of Computer Science and Engineering, NIT Warangal, Telangana in association with the Center for Continuing Education, NIT Warangal during March 01-10, 2021. The Course may facilitate upgrading knowledge, skill in the most advanced areas such as Data Science and Machine Learning. The faculty members in all disciplines of Engineering, Sciences, Mathematics, Life sciences, Management, Post-Doctoral Fellows, Research Scholars, PG and UG students who have an aptitude to work in the areas of data sciences and machine learning may participate in the Course. The Contents of the Course are:

- ***Introduction***

  What is Data Science, Real-life examples and Applications, Data Scientist: The Most Promising Job of the 21st Century, Machine Learning vs. Data Science vs. AI, Machine Learning Types, Generics of Machine Learning Approaches.

- ***Python Essentials***

  Installation of Anaconda, Python Editors and IDE's (Anaconda, Jupyter), Primitive Data Types, Lists, Tuples, Dictionaries, Strings, Data Manipulation Tools (Operators, Functions, Packages, Control Structures, Loops, Arrays), Importing Data from Various Sources (CSV, txt, Excel), Exporting Data to Various Formats.

- ***Probability and Statistics for Data Science Basic***

  Probability Theory, Random Variables, Probability Distributions, Markov models, Bayesian Learning.

- ***Regression***

  Univariate Linear Regression, Multivariate Linear Regression, Polynomial Regression.

- ***Classification***

  Logistic Regression, SVM, Multi-class SVM, Decision Trees, K-Nearest Neighbors.

- ***Ensemble Approaches***

  Bagging, Random Forests, Boosting: Adaboost, Gradient Boosting.

- ***Optimization***

  Gradient Descent, Stochastic Gradient Descent, Batch Gradient Descent.

- ***Clustering***

  K-means, Hierarchical and Other Clustering Approaches

- ***Feature Engineering***

  Feature Scaling, Feature Selection: Filter Methods, Wrapper Methods, Embedded Methods.

- ***Dimensionality Reduction***

  Principal Component Analysis, Linear Discriminative Analysis, Multiple Discriminant Analysis, Independent Component Analysis.

- ***Neural Networks***

  Introduction to Neural Networks, Back Propagation Algorithm and Theory Behind, Introduction to Deep Learning.

- ***Recommendation Systems***

  Introduction, Types of Recommender Systems, Content-Based, Collaborative Filtering: Matrix Factorization Based Approaches, Knowledge-Based, and Hybrid Techniques, Times Series Forecasting, Multi- Criteria Decision Making, Other Real Time Examples.

- Hands-on to the Majority of the Topics Using Python, Take-home Project.

For Further Details, Contact Coordinator, Dr. Venkateswara Rao Kagita, Assistant Professor, Department of Computer Science and Engineering, National Institute of Technology, Warangal-506004, Telangana, Mobile: 06281746931, E-mail: *venkat.kagita@gmail.com.* For updates, log on to: *www.nitw.ac.in/*

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THESES OF THE MONTH

SCIENCE & TECHNOLOGY
A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of September - October, 2020)

AGRICULTURAL & VETERINARY SCIENCES

Biochemistry

1. Khodifad, Bhargavbhai Chitharbhai. **Development of continuous microwave dryer for leafy vegetables**. (Dr. N K Dhamsaniya), Department of Biochemistry, Junagadh Agricultural University, Junagadh.

Biotechnology

1. Kant. **Production, purification and industrial application of miscrobial xylanase**. (Dr. Vikas Beniwal), Department of Biotechnology, Maharishi Markandeshwar University, Ambala.

Entomology

1. Vyas, Umeshkumar Maheshkumar. **Bio-rationale management of root rot [*Macrophomina phaseolina* (Tassi) goid] of sesame (*Sesamum indicum* L)**. (Dr. L F Akbari), Department of Entomology, Junagadh Agricultural University, Junagadh.

2. Zinzuvadiya, Hasmukh Dhirubhai. **Biodiversity of insect pollinators in economically important crops of South Gujarat**. (Dr. L V Ghetiya), Department of Entomology, Navsari Agricultural University, Navsari.

BIOLOGICAL SCIENCES

Biotechnology

1. Khullar, Shikha. **Glutathione metabolism and proteome analysis of ectomycorrhizal fungi in response to heavy metal stress**. (Dr. M Sudhakara Reddy), Department of Biotechnology, Thapar Institute of Engineering and Technology, Patiala.

2. Wahlang, Daniel Regie. **Cytogenictic and molecuolar analysis of genomic changes induced by colchicine in *Vigna radiate* (L) Wilczek and *Vigna mungo* (L) Hepper**. (Prof. Satyawada Rama Rao), Department of Biotechnology & Bioinformatics, North Eastern Hill University, Shillong.

Botany

1. Singh, Nutan. **Characterization and analysis of tissue-specific expression of chalcone synthase gene from *Coelogyne ovalis* Lindl under varying experimental conditions**. (Prof. Suman Khatri Kumaria and Prof. Pramod Tandon), Department of Botany, North Eastern Hill University, Shillong.

Food Science & Technology

1. Parelkar, Manisha Ajay **Comprehension of nutrition messages in labelling and its effect on the behaviour of graduate consumers in Mumbai**. (Dr. Jagmeet Madan and Dr. Madhura Kesarkar), Department of Food Science & Nutrition, S.N.D.T. Women's University, Mumbai.

Genetics

1. Teltumbade, Manoj Ramesh. **Transgenerational epigenetic inheritance of dietary factor-induced metabolic perturbation in Drosophila**. (Dr. Manoj Ramesh Teltumbade), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Marine Science

1. Harsimranjit Kaur. **Effect of garlic (*Allium sativum)* and (*Aloe vera*) supplemented feeds on survival, growth, health, flesh quality and brood stock development of Indian major carp, *Labeo rohita* (HAM)**. Department of Aquaculture, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana.

Zoology

1. Goel, Vivek. **Biodiversity of spiders (Araneae: Arachnida) of Haryana**. (Dr. Vinay Malik), Department of Zoology, Maharshi Dayanand University, Rohtak.

2. Nigam, Parag. **Chemical immobilization of select wild carnivores and ungulates using sedative and dissociative anaesthetics**. (Dr. Sushant Chowdhury), Department of Wildlife Science, Saurashtra University, Rajkot.

3. Shirsath, Kavita Sahebrao. **Modulatory role of HSP60 and related key genes in pathogenesis of atherosclerotic inflammation**. (Dr. Ranjitsinh Devakar), Department of Zoology, The Maharaja Sayajirao University of Baroda, Vadodara.

4. Vijay Singh. **Biodiversity of ladybirds (Coleoptera: Coccinellidae) in Haryana**. (Dr. Vinay Malik), Department of Zoology, Maharshi Dayanand University, Rohtak.

EARTH SYSTEM SCIENCES

Environmental Science

1. Daljeet Kaur. **Reduction in pollution load in wastewater from rice straw pulp bleaching through process modification**. (Dr. Rajesh Kumar Lohchab and Dr. Nishi K Bhardwaj), Department of Environmental Science, Guru Jambheshwar University of Science & Technology, Hisar.

2. Lalnunthari. **Study on Arbuscular Mycorrhizal Fungi (AMF) communities from Jhum Lands in Mizoram, India**. (Dr. John Zothanzama and Dr. R Lalfakzuala), Department of Environmental Science, Mizoram University, Aizawl.

3. Renthlei, Vanlalpeka. **Rattans and palms ecology of Mizoram**. (Prof. Lalnuntluanga), Department of Environmental Science, Mizoram University, Aizawl.

4. Sangma, Tremie M. **A study on effect of anthropogenic disturbance on diversity, distribution and community characteristics of plants in the Nokrek blosphere Reserve of Meghalaya, India**. (Prof. B P Mishra), Department of Environmental Science, Mizoram University, Aizawl.

5. Tlangte, Tlangthanpuii. **Study of bryophytes and their economic importance in Aizawl District, Mizoram**. (Prof. Lalnuntluanga and Prof.H Lalramnghinglova), Department of Environmental Science, Mizoram University, Aizawl.

ENGINEERING SCIENCES

Chemical Engineering

1. Shukla, Chinmay. **Process intensification of multistep synthesis involving diazonium salts**. (Dr. Anmol A Kulkarni), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Vahidhabanu, S. **Synthesis and characterization of clay modified adsorbents and their removal efficiency towards a dye pollutant**. (Dr. B. Ramesh Babu), Faculty of Physical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Civil Engineering

1. Gupta, Nikita. **Strength and durability properties of self-compacting concrete incorporating copper slag**. (Dr. Rafat Siddique), Department of Civil Engineering, Thapar Institute of Engineering and Technology, Patiala.

Computer Science & Engineering

1. Gupta, Deepak. **A novel framework for analysis of big data**. (Dr. Rinkle Rani), Department of Computer Science & Engineering, Thapar Institute of Engineering and Technology, Patiala.

2. Gagandeep Kaur. **Efficient watermarking for high efficiency video coding**. (Dr. Singara Singh Kasana and Dr. M K Sharma), Department of Computer Science & Engineering, Thapar Institute of Engineering and Technology, Patiala.

3. Gupta, Subodhini. **An integrated framework for knowledge extraction using clustering and classification**. (Dr. Anjali Jivani), Department of Computer Science & Engineering, The Maharaja Sayajirao University of Baroda,Vadodara.

4. Jaspreet Kaur. **Reliable, efficient and reconfigurable model for disaster management in wireless sensor networks**. (Dr. Amit Kumar Bindal), Department of Computer Science & Engineering, Maharishi Markandeshwar University, Ambala.

5. Lahon, Maushuni. **Assessment of risk and approach towards remedial measures in component based software development**. (Dr. Uzzal Sharma), Department of Computer Science & Engineering, Assam Don Bosco University, Guwahati, Assam.

6. Narwal, Ekta. **Study, design and simulation of security measures in vehicular ad hoc networks using techniques of artificial neural networks**. (Dr. Sumeet Gill), Department of Computer Science & Engineering, Maharshi Dayanand University, Rohtak.

7. Prakash, A. **Improved accuracy of continious user authentication fusing facial hard and multisoft traits**. Department of Computer Science & Engineering, Hindustan Institute of Technology and Science, Chennai.

Electrical & Electronics Engineering

1. Jena, Tarakanta. **Fractional calculus based hybrid controller design for LFC analysis**. (Dr. Manoj Kumar Debnath and Prof.S K Sanyal), Department of Electrical Engineering, Siksha O Anusandhan University, Bhubaneswar.

2. Samant, Piyush. **Development of diabetic and related disease identification system using IRIS**. (Dr. Ravinder Agarwal), Department of Electrical and Instrumentation Engineering, Thapar Institute of Engineering and Technology, Patiala.

3. Srivastava, Satyam. **Design and development of non-destructive sensing based portable system to predict quality parameters of on-tree fruits**. (Dr. Shashikant Sadistap), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

4. Surender Singh. **Intelligent algorithm for optical and reliable operation of power distribution system**. (Dr. V R Singh and Dr. Rakesh Ranjan), Department of Electrical & Engineering, Maharshi Dayanand University, Rohtak.

Information & Communication Engineering

1. Deeptha, R. **Design of an enhanced openId connect towards enerprise and mission critical applications**. (Dr. Deeptha R), Department of Information Technology, Hindustan Institute of Technology and Science, Chennai.

Material Science and Engineering

1. Vinit Kumar. **Synthesis and characterization of metal nanocomsites and their application for the removal of water contaminants**. (Dr. Ashok K Sharma and Dr. Alok Mittal), Department of Materials Science and Nano Technology, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

2. Viswanath, Abhilash. **Computational modelling of the low pressure casting process: Experimental validation and similitude analysis**. (Dr. S. Savithri), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Mechanical Engineering

1. Manpreet Singh. **Design and development of a rotating core based magnetorheological finishing process for different external cylindrical surfaces**. (Dr. Anant Kumar

Singh), Department of Mechanical Engineering, Thapar Institute of Engineering and Technology, Patiala.

Structural Engineering

1. Vankudothu, Bhashya. **Investigations on treated recycled aggregate concrete with and without mineral admixtures**. (Dr. B H Bharatkumar), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Textile & Apparel Design

1. Shrimali, Khushboo. **Study in Eco-friendly anti-microbial finish for celluslosics**. (Dr. Ela Manoj Dedhia), Department of Textile and Apparel Designing, S.N.D.T. Women's University, Mumbai.

MATHEMATICAL SCIENCES

Mathematics

1. Asthana, Shivangi. **A study on diophantine equations and related problem**. (Dr. Madan Mohan Singh), Department of Mathematics, North Eastern Hill University, Shillong.

2. Chotaliya, Narendrabhai Thakarshibhai. **Continuum hypothesis problem: Logical and philosphical implications**. (Dr. S S Sharma), Department of Mathematics, Saurashtra University, Rajkot.

3. Chudasama, Hiren Pravinbhai. **Some results of new labeling techniques and its applications in Graph theory**. (Dr. V J Kaneria), Department of Mathematics, Saurashtra University, Rajkot.

4. Garg, Rohit. **On the structure of automorphism groups of finite groups**. (Dr. Deepak Gumber), School of Mathematics, Thapar Institute of Engineering and Technology, Patiala.

5. Monika. **Reliability models on systems with conditional warranty and its implications**. (Dr. Gulshan Lal Taneja), Department of Mathematics, Maharshi Dayanand University, Rohtak.

Statistics

1. Nandal, Naveen. **Availability analysis of systems with different configurations and repair policies**. (Dr. S C Malik), Department of Statistics, Maharshi Dayanand University, Rohtak.

MEDICAL SCIENCES

Biochemistry

1. Sah, Narendra Kumar. **To assess serum free T3 (fT3), free T4 (fT4) and serum anti-TPO antibodies in patients of type2 diabetes mellitus**. (Dr. Suvarna Prasad), Department of Biochemistry, Maharishi Markandeshwar University, Ambala.

Biotechnology

1. Dahiya, Bhawna. **Detection of mycobacterial RD antigens by nanopartical based immuno-PCR for the diagnosis of pulmonary and extrapulmonary tuberculosis**. (Dr. Parmod Mehta), Department of Biotechnology, Maharshi Dayanand University, Rohtak.

Pharmaceutical Science

1. Akash. **Phytochemical investigation of some dietary supplements for management of Alzheimer's disease: Development of suitable drug delivery system for effective brain targeting**. (Prof. Sumitra Singh and Prof. S K Singh), Department of Pharmaceutical Science, Guru Jambheshwar University of Science & Technology, Hisar.

2. Apte, Madhavi. **Comparative pharmacognostic, phytochemical and biological evaluation of the various parts of Indian Dhak tree Butea monosperma**. (Dr. Milind Bhitre), Department of Pharmaceutical Science, S.N.D.T. Women's University, Mumbai.

3. Harmeet Kaur. **Synthesis and antimicrobial evaluation of diazenyl derivatives**. (Dr. Narasimhan B), Department of Pharmaceutical Science, Maharshi Dayanand University, Rohtak.

4. Mallya, Rashmi. **Pharmacognostic, phytochemical and biological evaluation of leaves and fruits of Zanthoxylum rhetsa**. (Dr. Milind Bhitre), Department of Pharmaceutical Science, S.N.D.T. Women's University, Mumbai.

5. Ramesh Kumar. **Synthesis and antimicrobial evaluation of novel Isatin derivatives**. (Dr. Mahesh Kumar), Department of Pharmaceutical Science, Maharshi Dayanand University, Rohtak.

6. Samridhi. **Synthesis and biological evaluation of some newer sulphonamide derivatives**. (Dr. Vikram Jeet Singh), Department of Pharmaceutical Science, Maharshi Dayanand University, Rohtak.

7. Sharma, Kailash. **Psychopharmacological studies to identify plants possessing anti-anxiety potential and to develop a new laboratory model**. (Prof. Milind Parle), Department of Pharmaceutical Science, Guru Jambheshwar University of Science & Technology, Hisar.

8. Vohra, Kripi. **Formulation and evaluation of anticancer potential of lens culinaris medikus seeds**. (Dr. Harish Dureja and Dr. Vandana Garg), Department of Pharmaceutical Science, Maharshi Dayanand University, Rohtak.

PHYSICAL SCIENCES

Chemistry

1. Babachary, Kalvacherla. **Synthesis of novel heterocyclic compounds using arynes and synthetic studies towards parvistone B and pericocin C**. (Dr. P Radhakrishna), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Donikela, Sangeetha. **Studies towards the synthesis of teixobactin and application of cyclohexadienones for oxygen heterocycles**. (Dr. S Chandrasekhar), Faculty of Chemical

Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Jain, Preeti. **Investigations on cobalt catalysts for energy applications**. (Dr. C.P. Vinod), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

4. Ladwa, Paresh Dhanjibhai. **Studies on heterocyclic compounds**. (Dr. Jayesh J Modha), Department of Chemistry, Saurashtra University, Rajkot.

5. Nadella, Lavanya. **Synthetic studies towards anti-cancer drug, eribulin mesylate**. (Dr. S Chandrasekhar), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

6. Rahman, Noimur. **Synthetic approaches for pharmacologically important oxygen and nitrogen containing heterocyclic compounds**. (Dr. R L Nongkhlaw), Department of Chemistry, North Eastern Hill University, Shillong.

7. Reddy, Nagarjuna. **Stratagies for the syntheasis of spirocyclic sultams, bridged imidazo pyridine and chiral 3,3'-disubstituted isoindolin-1-ones**. (Dr. B.V. Subba Reddy), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

8. Saha, Dipika. **Spectroscopic investigations on the interaction of semiconductor particles with selected molecules**. (Dr. D P S Negi), Department of Chemistry, North Eastern Hill University, Shillong.

9. Shangpliang, O Risuklang. **Development of new methods for the synthesis of organic compounds using selenium dioxide**. (Prof.B Myrboh), Department of Chemistry, North Eastern Hill University, Shillong.

10. Suriyakumar, Shruti. **Nanostructured electrodes and electrolytes for lithium sulfur batteries**. (Dr. A. Manuel Stephan), Faculty of Physical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

11. Verma, Anil. **Synthesis, characterization and antimicrobial activity of some novel azole derivatives**. (Dr. Joginder Singh), Department of Chemistry, Maharishi Markandeshwar University, Ambala.

12. Yadav, Pragya. **Isolation, chemical transformation of natural products and synthesis of natural product analogues of biological importance**. (Dr. T Narender), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Physics

1. Bhasin, Tanvi. **Investigation of crystal structure, dielectric and magnetic properties of $ZnFe_2O_4$ and$Na_{0.5}Bi_{0.5}TiO_3$ based multiferroic composites**. (Dr. Ashish Agarwal), Department of Physics, Guru Jambheshwar University of Science & Technology, Hisar.

2. Gayathri Prabhu, T G. **Tungsten oxide based electrochromic devices for energy management and regulation**. (Dr. Biswapriya Deb), Faculty of Physical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Manani, Nilesh Himatlal. **Growth and characterization of magnesium-cobalt and other mixed levo-tartrate crystals**. (Dr. H O Jethva), Department of Physics, Saurashtra University, Rajkot.

4. Sunita Rani. **Structural optical and electrical characterization to tellurite based glasses**. (Dr. Neetu Ahlawat and Dr. R S Kundu and), Department of Physics, Guru Jambheshwar University of Science & Technology, Hisar. ❑

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