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Sustainable Education: Curating a Future Ready Template

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Abstract: ***A paradigm shift is set to disrupt the way one learnt and earned. The world, today, requires a 'plug and play' employee. Traditional archetypes of rigid knowledge sharing proformas are clearly not delivering required outcomes. Gross Enrollment Rate (GER) does not match Labor Force Participation Rate (LFPR). Education needs to be future ready by reinventing the means necessary for achieving new outcomes. This is critical if we do not wish to witness a rerun of the massive redundancies at Technological Companies with the advent of the single phenomenon: artificial intelligence. What improvements are required in the Indian Teaching -Learning process, that may yield a rich demographic dividend that contributes to national GDP, and also, transform India into a destination of international education capital? Will India deliver a template for 'sustainable education'? The paper intends to attempt to answer these concerns.***

Keywords: Sustainable Education, AI disruption, Gross Enrolment Rate (GER) correlation with Labor Force Participation Rate (LFPR), NEP analysis, Andragogy, Lifelong Learning

1. Introduction

The focus of this paper**, 'Sustainable Education',** differs from **Sustainability Education** in that the paper does not study the means to practice environment friendliness towards the mitigation of climate change challenges. It takes a focused view of how the 'system of Education' as we practice it across the globe, especially in India, fares in the current context of AI disruptions. Is it going to be able to sustain its relevance? This question is not merely a philosophical one but also has economic ramifications. There is an entire ecosystem that functions on the education system as it exists now. Therefore, to make education sustainable, one needs also to consider the utility or obsolescence, of the human framework associated with the processes.

At a plebian level, education is linked to livelihood, and is a commodity to be monetized, towards personal as well as national growth. Indeed, the seats of learning, the schools and universities across the world, do not run on love and fresh air. Their primary pursuit of intellect is unequivocally co-extant with a strong sense of commercialism. Education is intrinsically linked to its economics; what goes into the process and what comes from it.

The paper studies the pertinence of pre-existing ways in which education systems have functioned, in the present context of AI, and evaluates whether it may remain sustainable. Though the concern is global, for the sake of a point of reference, the focus of this paper is mostly on the Indian Education System. It aims to study the relevance of formal education in the job market, while simultaneously focusing on the relevance of human educators in brick-and-mortar institutions of learning, offering structured formal degrees in an AI driven self-learning world, where skills matter more than degrees at the recruitment tables.

An emerging Indian demographic is populated by 70% in the middle-income group. For many of these aspirational Indians, education is not an end in itself, it is, rather, a means to an end: the dream of a better life, a decent job and the fruition of one's hopes for one's next generation. Education, then, is not a luxury, it is a necessary tool to uplift one's living standards, one family at a time, coalescing into the collective upliftment of the living standards of an entire nation.

Technological advancements have impacted both the tools as well the landscape of the job market. One has seen the changes in education and employment in India: since the late 1900s, in leaps and bounds, and since the 2020s, at warp speed.

'Sustainable Education' proposes to look at means to augment or redesign the education system in India in a manner that addresses *both the concerns* of it being Industry Relevant as well as AI proof. One does not yet fully understand the implications of AI supplanting all roles that humans engage themselves in. Hence fully automating the education system has its challenges. The majority of educated Indians being unable to contribute to the GDP through adequate engagement, either because of unemployment or underemployment. A relook at the education system, therefore, despite the revisions of the National Education Policy 2020 (NEP), is due.

The study of creating a draft for sustainable education, one which will endure the disruptions of technology and the vagaries of the global market, would do well to begin by evaluating the present template prescribed by the national government (of India) along with a critical evaluation of its challenges, if any. Towards that end, an understanding, first, of what the National Education Policy (NEP2020) states and how it may be customized to last the distance, appears to be a good place to start.

A critical analysis of the generic ideas of National Education Policy 2020 in tandem with a mention of where it needs augmentation, edits etc may be enumerated as follows:

- Recognizing the Importance of Formative Years: The policy adopts a 5+3+3+4 approach for school education beginning at age 3 to recognise the primacy of the formative years.
  Will not have the desired effect if adequate number and quality of teachers are not available for deployment.

- Breaking Free from the Silos Mentality: another major aspect of the new policy is the abolition of the strict division between high school arts, commerce, and science programmes.
  Will need teachers to be equipped to handle multidisciplinary programs and MI in learners

- The addition of vocational courses that involve an internship is another excellent feature of the programme. This may motivate those from lower socioeconomic backgrounds to enrol their children in school, since learning trades along with knowledge, equips one for early employability.
  Learners should be given autonomy to choose instead of it being pre-determined on the basis of ethnicity, family financial status or traditions. It would also help to meet the goal of the Skill India Mission.

- Increasing Educational Inclusion: According to the NEP, the Right to Education (RTE) should be provided to all children up to the age of 18
  Right and 'Equitable access' in real time, are, however, 2 different issues.

- Allowing Foreign Universities to Open Campuses in India: According to the report, universities from the world's top 100 universities will be allowed to open campuses in India.
  Once again equitable access is crucial without which the idea of mentoring smaller organizations will not achieve fruition and this will become a mere tool to further commercialize education. As a result of this infusion of international perspective, India's educational system should ideally become more efficient and competitive.

- The Hindi vs. English Language Debate Is Over: Most notably, the NEP puts an end to the divisive Hindi vs. English language argument by emphasising the necessity of using the mother tongue, or regional language as the medium of education until at least Grade 5, while English is regarded an important medium of instruction for accessing global knowledge and may be included in the mix of options in education, from a higher class, after class 5.
  Once again, in the scenario of continued paucity of quality vernacular teachable content, this idea may not achieve desired goals.

- One needs more workers at the grassroots levels: more teachers, mentors, support staff, infrastructural support, connectivity, access to new technology and EdTech rather than more regulations and regulatory authorities, more accrediting committees, more idea sharers.

The present scenario is top heavy, and top down.

Technology (AI) may truly be either an enabler and force multiplier or a divisive agent. It is a twin edged sword to be exercised very carefully.

Some of the already extant landmark Government Initiatives, apart from NEP, that encourage better education in India include

- Sarva Shiksha Abhiyan
- Digital India
- Skill India
- Atal Tinkering Labs
- Mid-Day Meal Scheme

In order that these do not remain mere paper measures, one requires the Public Distribution System (PDS) in India to work effectively. Governmental initiatives usually do not percolate down to the end users at the last mile.

If one is to evaluate education only as a contributor to a country's employment rate, then the outcomes are unsatisfactory. Most of the jobs available in India specially, as also in many parts of the world now, are grunt work. Labour Intensive jobs do not require more than the very basic of educational competence. Fluency in literacy and numeracy (FLN) is enough, with a basic level of computer literacy, available now with anyone owning an android phone. For that reason, the largest percentage of employability in India is at the undergraduate level. However, even where there are instances of a robust GER, the absorption of graduates into the workforce is not smooth. The industry feedback regarding the low levels of employability of graduates focused on the lack of domain as well as professional skills. However, these analyses were before the advent of ChatGPT and recently DeepSeek's routing of the existing scenario, and making most skills or knowledge redundant, AI, GenAI or agentic AI are taking care of them for free.

2. Literature Review

The emergence of Artificial Intelligence being new, there is not enough literature conventionally available, on the topic of curating AI proof education policies that contribute to the design of a system that will address India's needs as a nation aspiring to dominate world education and employment scenario. There has, however, since the early 2000s, been numerous discussions on the domestic mismatch between the requirement of Industry Readiness among graduating students and that supplied by the classrooms. NASSCOM flagged it in mid 1990s. Remediation measures have not bridged the gap that has expanded post Covid with a paradigm shift in the way the world works. For this study the resources delved into as research literature, have included a study of ILO Data on the Indian Employment Report 2024, survey reports on Skill Development and Productivity as well as an assessment of Employment and Unemployment Statistics in India, vis a vis one's level of education. Information was also gathered from 'National Sample Surveys and the Periodic Labour-Force Surveys between 2000 and 2022, with a postscript for 2023 as well as other sources of data from the Annual Survey of Industries, the National Account Statistics and the Reserve Bank of India-KLEMS database. '

Specifically: [India Employment Report 2024: Youth employment, education and skills, Geneva: International Labour Office, year. © ILO.] which shares insights on how Labour Force Participation Rate (LFPR) and Employment rates, which dipped till 2019, have risen post Covid.

There was an advisory in the content sourced from the ILO Report, to carry the following disclaimer in very clear and uncorrupted format provided, and hence it has been reproduced verbatim:

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Since all education requires to be outcome based and a crucial outcome of all education may safely be considered securing decent livelihoods while contributing to the growth of the nation's GDP, the mentioned resources gave the paper the ground realities of educational outputs today. (https: //in. search. yahoo.com/search?fr=mcafee&type=E210IN826G0&p=Skill+Development+and+Productivity+of+the+Workforce).

Much has been discussed in various fora with regard to the NEP-India, and its revisions. Hence that was a significant contributor in considering the future of an education format that would sustain the aspirations of the country in becoming a powerful economic force in the world. (Ministry of Human Resource Development, 2020; University Grants Commission, 2020). The correlation between education received through formal degrees and commensurate employment of the educated person was also researched to the extent possible. (Directorate General of Employment, 2023; Statista, n. d.; University Grants Commission, 2020).

Also researched were, discussions on future proofing education by eminent intellectuals online who not only understood that AI proofing education required more humaneness and less digitalization. It was felt that customizing education through available digital platforms and training learners to self-learn instead of being completely dependent on brick-and-mortar institutions, was a potential way forward (Teaghan, n. d.). However, whether this would cater to the psychological needs of all learners across strata, was contentious.

Some education systems worldwide were studied to gain better insights into what factors made them successful and acclaimed. Europe, China, Singapore etc were researched for their educational practices and approaches (Ministry of Education Singapore, n. d.; Organisation for Economic Co-operation and Development, 2024; Understanding Children's Work Programme, 2013). These countries were chosen on the basis of their institutions being consistently ranked high in the HEI global metrics.

Andragogy and Multiple Intelligences theories have also been studied to offer insights into a future roadmap of developing capable teachers able to offer Sustainable Education (Drexel University School of Education, n. d.; University of Illinois Springfield, n. d.).

Information was also gathered from 'National Sample Surveys and the Periodic Labour-Force Surveys between 2000 and 2022, with a postscript for 2023 as well as other sources of data from the Annual Survey of Industries, the National Account Statistics and the Reserve Bank of India-KLEMS database. ' Specifically International Labour Organization (2024) which shares insights on how Labour Force Participation Rate (LFPR) and Employment rates, which dipped till 2019, have risen post Covid. These statistics gave an understanding of how the educated (Indian) shapes or impacts the nation's GDP.

Gupta (2025): This provides information source for the author's understanding of what would ideally constitute sustainable education content. The euphoria surrounding STEM could well lose its popularity if accuracy and scientific information were to shift as the critical points of foci of education. With the advent of AI, this is a probable fallout at the basic level of using, not creating, knowledge.

Nayak (2025), explores alternative andragogical methods to curate sustainable education.

Legal Chariot (2025), discusses means to plug the skills gap in the journey from classrooms to corporate cabins.

Gandhi (2025): In the spirit of true democratic freedom, a consideration for discourse among the beliefs of NEP critics. Business Today (2025) leads towards an understanding of the broad reasons for unemployment in India, despite a decent GER, at 28.4% expected to escalate to 50% by 2030.

People Matters (2025) explores generically, the enabling effects of AI in recruitment. Ironically, replacing humans in Human Resources (HR) roles.

The Telegraph (2025) glimpses the stark and cold futures of AI driven lifestyles, completely unaware of emotions of empathy, community, sharing or caring.

3. Methodology

The paper proposes to theoretically evaluate all forms of content relevant to understanding the challenges in monetizing one's earned degrees. It also proposes to look at areas where AI may augment human educators instead of substituting teachership altogether. Research findings on modernizing education in countries with highly ranked Universities at the QS ratings etc, have also been studied to understand how the Indian systems may adapt to have better outcomes.

An online survey was conducted by author, via Google Forms and the data analysed for an understanding of the knowledge workers' perspectives with regard to whether the content, delivery or design of educational content is failing the Indian student in her endeavour to garner commensurate employment and contribute, at least in part, to the objective of education (Google Forms, n. d.)

4. Discussion

For education to be sustainable and future ready, it needs to meet its desired outcomes. In order to judge the efficacy of the current Indian Education System, one would require a modicum of background knowledge regarding the outcomes of the education process in terms of employment and employability. Let us begin by tracking the correlation of education levels of those participating in employment sector in India in recent times – specifically a contrast data gathered between pre and post Covid 19 scenarios.

As observed from a study on the young Indian demographic's Labor Force Participation Rate (LFPR), major changes have impacted the employment and employability scenario post Covid 19. Female labour market participation rate has peaked post Covid in the informal and self-employment sectors. There was also a marked shift from agriculture to non-farm sectors peaking in productivity, primarily in the sectors of construction and services.2000 to 2019 also saw an increase in mechanization which meant more skilled labour in the market although, volume of LFPR dropped because of machines substituting, in some cases, the need of workers. This marked shift in category of livelihoods in the informal sector, post Covid lockdowns, was not what was the aspirational objective of structured formal education.

The time period 2000-2019 witnessed the birth of rampant digitization, leading to an increase in platform and gig work, manned by informal personnel but run by persons having graduate education or above. Digitization and digitally enabled processes have, since, enhanced migration rates to 40% and growing, from West Bengal, Uttar Pradesh, Odisha etc to states South, West and North of India, which are gradually getting saturated

The ILO statistics (2024) describe poor retention in, and returns to, education programs, particularly at the lower levels. Technically educated, non- student youth have poor participation in the employment sector. This also holds true for vocationally trained non – student youth, raising concerns about the quality of these educational and training programs. Though employment participation is inversely proportional to education in most fields of study, there is a marginal contradiction in terms of technically qualified graduates earning substantial employment opportunities in the market.

There is, however a need to mention that the employment sector often fails educated persons in providing them with jobs that they aspire to. Many educated persons are overqualified for the jobs they have, often after 1 year of waiting to obtain one after studies. Though apprenticeship training, vocational training as well as technical programs at graduation level create a bench-strength of capable workforce, actual real time absorption into the labor markets is short. This results in a skewed supply-demand scenario that results in less than competitive remuneration. Simultaneously, gender disparity in LFPR is also a marked area of concern. As in 2022, only 25% of eligible women have chosen to participate in the workforce. The number of unemployed youths despite decent education levels was high between 2000 and 2022, leading to a derivation that higher qualifications would not naturally result in higher absorption into the country's economic engines. Education also fueled a heightened level of aspiration among the youth. There were, however, mismatches between education level and relevant skill levels required for highly skilled jobs that were the aspiration of these educated youth. This not only highlights the weaknesses of the employment sector but also a gap in the education system that appears to be unable to generate the skillset needed commensurate with the level of education. One of the global reasons for this mismatch is the rapid pace of change that is happening in technology worldwide. Classrooms, institutions, universities that are not driving the change are being swept away by it. India is almost at its peak of being able to harvest the demographic dividend. The percentage of youth in India has been calculated to be at 63% in 2022, and approximately 65% in 2025. Though there is a definite decline in fertility rates, there is significant gains to be made if India can achieve full potential of youth employment contributing to country's GDP. However, the education and employment curves seem to remain largely unaffected by each other. GER and LFPR are not seen as impacting each other noticeably.

Rapid digitization drives across the country during and post Covid, have led to a booming platform and gig economy. Though these jobs are informal and often contractual, there are significant numbers of educated employable youth involved in this. The Boston Consulting Group estimated this market size to be between 8 to 18 million in 2021, with a projected 10x growth forecast over the next decade. Niti Ayog, India, concurs. Once again, the outcome noticeable is that there is no direct benefit of an educational degree in gaining employments like these. In fact, this is a testament to self-learning of youth via online portals that give them the technological skillset needed to operate these gigs.

Post Covid rise in employment, in India, was seen mostly in agricultural sector, with the educated mass, gravitating towards the industries of construction and services. The trend may be correlated to increased and free education via online mode, pervasive during Covid19 lockdowns. Employment in the manufacturing sector saw a shrink at 12-14%. In this case, online education may have played a role in the supposition that the learners were not sufficiently experienced with training and skilling with real situations, being forced to only simulate the environment in dry labs on screens. In the case of tier 2 or 3 institutions which were not prepared to transition similarly, this was a serious challenge. Since 2020, gross enrolment ratio (GER) has steadily been increasing in India. From approximately 40 million to a projected increase of up to 92 million by 2035. This did not translate into equal LFPR. (https: //www.statista. com/statistics/1286736/india-estimated-growth-of-student-). Despite an apparent disconnect between the educational outcomes required for the in-demand employment opportunities and the required educational competence generated in institutions, the education industry is thriving. While the gap between demand of skills and its supply are not in sync, the involvement of the nation in the process of education, (however flawed it might be in the present context) is robust. Our GER is at 57.6% (2021-22) (Statista, n. d. -b).

Dr. Ashwin Fernandes, QS Executive Director for Asia, Africa, Middle East, and South Asia, discusses the reasons

why India should be the next destination for higher education. Though there are multiple numbers of colleges, universities in India, which have a decent number of students belonging to our neighbouring countries, the challenge of drawing students from the developed parts of the world remain, barring into a few acclaimed Indian Centres of Excellence. The highest enrolment of foreign students in India happen in UG Technology Programs (74.8%). Despite potential for exponential growth here, Indian education system has not been able to attract global attention or investment owing to the following areas of weakness:

Inadequate Funding, Teacher Deficiency (quality as well as quantity), Outdated Curriculum, Lack of Infrastructure, Digital Divide, Disparities, Insufficient Teacher Training etc. These areas have been highlighted by the AISHE Report 2021-2022 (Aniket, n. d.).

At the Indian School of Public Policy (ISPP), [proceeds published Feb 7th, 2024,] all of the above problems are discussed in terms of solutions and timelines even though the outcomes are yet to unfold in real time (Indian School of Public Policy, n. d.)

In this context then, how does one bridge the gap that has arisen between industry and academia? Industry, today, wants a 'plug and play' candidate, the HEIs in India are struggling to deliver. Skills are, apparently, not easy to come by, though degrees are in place. Also, attitudinal shifts required between studentship and professional life are not addressed in any curriculum. Some English Language Skills, packaged as Soft Skills sessions, are offered to pre-placement students in some institutions of learning, which naturally fail to generate holistic Industry Readiness.

Sustaining GER is a challenge in India where many learners need to support their families even while they are students. The concerns of a strata of society where young students are engaged in manual work, agricultural work or other means of employment for at least 15 days a month to support their family earnings, while undergoing junior or senior levels of education need to be factored in while designing the components of an educational system. Per ASER 2017, out of 87% of youth enrolled, 77% need to work to supplement their family income.

Digital Literacy is abundant in Indian youth. Digital Open Learning Models too, will definitely gain more traction in the not-too-distant future. While online courses reap a rich dividend in the education industry, it is important, to assess the students correctly before awarding them a level of educational clearance. Towards this end, the curricular inputs as well as the assessment parameters must be in sync with the industry ask. (ASER 2023) (Francis, 2024) suggests testing for

- Digital Literacy
- AI usage competence
- OLM (Open Learning Models) usage/achievements
- Good human Role Models to emulate so that traditional mindsets are broken and one dares to aspire

H. B. Raghavendra, 'India needs to prioritize teacher development in higher education' (Published Jan 12, 2025, 9am, IST) The article highlights the free and easy accessibility of learning platforms, both national as well as international (NPTEL-Swayam/Coursera etc). Yet, the gaps of learning and industry readiness persist. Lack of availability of knowledge is *not* the leading cause of unemployability in young, educated adults. What *is*, is subject to further research. It may be hypothesized to be a ***skills gap***, rather than a knowledge gap.

If the gap between Industry and Academia is a skills gap, it needs support at the educational institute level itself. To plug the skills gap, the Government of India's flagship NEP envisions the promotion of experiential learning via industry projects, internships and trainings. Educational Institutes typically emphasize the professional qualifications of their members of Teaching Faculty in terms of their theoretical knowledge: whether one is a Masters, Doctoral, Research oriented member. Laboratory Staff, on the other hand, are not assessed for their skills stringently. Most Recruitment Interviews are theory-based assessments, which cannot test for skills. (Vice Chancellor, CMR University, Bengaluru.) Published-January 12, 2025 09: 00 am IST (The Hindu, 2025).

The rampant mechanization of industrial processes today is a marker of availability of skilled workforce which is available only as a result of increased exposure to on-job education/training, or the same via self-help videos. Indeed, since many of these areas of employment did not even exist pre-Covid, it is moot that incorporating the digital content and engaging users to brainstorm /crowdsource knowledge is a robust plan going forward. Formal education may be inclusive of these aspects of employment just like one absorbed Retail Management in the MBA studies. Therefore, content creation or curating digital classes or developing digital teaching assistants (DTA) course be a path towards new courses.

There is permanent *employability*, not permanent employment, in the present world. Jack Welch rightly remarked, "You can give lifetime employability by training people, by making them adaptable, making them mobile to go to other places to do other things. But you can't guarantee lifetime employment. " Therefore, they must learn, unlearn and relearn regularly. (https: //www.peoplematters. in/article/leadership/how-to-bridge-the-gap-between-academia-and-industry-in-india-32804) This agility is a crucial tool that is mandatory to enhance employability, and needs to be incorporated in the curriculum.

To ideate an education system that would deliver the outcomes of employability in a sustained future ready mode, it was important to study the world renowned and highly ranked education systems globally, in order to ascertain their areas of excellence that contribute to such high regard. QS ranked education systems were chosen for an in-depth comparative analysis, vis a vis the Indian system.

A summary of best practices worldwide, yields the following ideas:

The education system of Singapore prioritizes

- The aim to create Life Long Learners
- Impartation of holistic education through not only FLN, but also inputs via physical, aesthetic, social, moral, music and sports education
- Incorporation of **Values in Action Program** which leads one not only to theorize but also to apply the thoughts in order to achieve tangible outcomes
- **Focus on Applied Learning:** more experiential than theoretical
- Creation of certified **National Institutes of Teacher Training** with periodic refresher courses- *this is India's biggest lacuna*
- Making mandatory the teaching of all subjects till Class 6
- Incorporation from Class 7 onwards, choice-based majors and other subjects as minors (interdisciplinary overlaps of up to 2 subjects)
- **(Singapore runs) a 'Gifted Education Program'** from there on, for those with special abilities
- (The Singapore Education system also has) a special provision for an **Express Course Option** // to GCE – O Level
- (Singapore Education system offers) **NA (Normal Academic) Course** for 4 years
- **NT (Normal Technical) Course** for 4 years
- **National Schools (actually colleges) for HE/TT (Higher Education/Technical Training** in Arts, Sciences, Sports, Technology and Culture. Each of these would include a major and interdisciplinary minors (Advanced Electives and Electives) with mandatory credit based exposure to Art, Music, Social Service, Nature Treks
- **Post Graduate Studies** encouraged for the single-minded outcome of R&D, not mere knowledge or degree acquisition, whereupon UGs and PGs vie for the same market opportunity
- **Universities to be CoE with at least one partner** from a higher **globally ranked** and one lower globally ranked University (so as to be mentored and mentor) along with an **industry collaborator** related to the domain (s) taught at the focus university.
- **Mandatory Adults' Reskilling/Upskilling Life Long Learning (L3) Program for 20 years or retirement** whichever is earlier. This is a compulsion against a service bond for any employee irrespective of domain of employment. This is especially true for educators and doctors.
- 4 thrust areas – namely: informed choices, constant evolution and revision of all processes, career development and employer recognition (how one will ensure compliance, is grey) and L3 culture.
- (Ministry of Education Singapore, n. d.)

A UNESCO and OECD education survey findings were that:

- UNESCO reports suggest that Education correlates to more secure jobs with formal contract of employment
- In surveyed countries, education relates to higher wages, albeit with a universal discrimination of wage levels in favour of males

Norway has the best enrolment and completion rates in the world. This is augmented by the Life-long Learning system which ensures constant upskilling in terms of trends in knowledge as well as skill. What contributes to continued education as well as employment for all genders is the daycare provisions (for 1st to 4th graders) provided mandatorily by municipalities where schools/offices are situated. In High School a learner is allowed a choice of programs of studies where the General Stream learners opt for Arts, Science, Technology, Music Arts, Drama, Sports etc. Whereas, the Vocational Stream learners study Design, Electrical, Mechanical, Civil, Skills, Health and Social Care, Media, Hospitality, Service, Transport, Production etc. Norway has a robust L3 system which is offered virtually as well and is, in many cases, mandatory (Organisation for Economic Co-operation and Development, 2024; Understanding Children's Work Programme, 2013) (OECD Data)

Detailed research of the Swedish education system yields that:

Swedish National Educational system has Sami Schools for Indigenous Sami children which is an emulatable practice for children of rural India so that the uniqueness of culture is sustained to a certain degree. This would need to be imparted before high school level so that if the learner wishes to acclimate to an urban and mainstream employment/higher education scenario, one may make an informed choice to continue or change the direction of one's primary education. In the scenario of the learner wishing to discontinue the unique rural culture-based education, the foundation having been made, one may remember, and apply this knowledge, going forward.

Diversity is integral to holistic, sustainable education. Cultural Diversity is a natural phenomenon in most popular Indian institutions because interstate migrations are common. The few clearly defined types of diversity to be mandated and harnessed are as follows: race, ethnicity, religion, language, religion, socio-economic status, sexual orientation, gender identity.

To manage diversity in the classroom, one requires to:

- Acknowledge, respect every student
- Practice inclusive communication
- Incorporate diversity in lesson plan
- Give student freedom and flexibility
- Curate assignments and projects that reflect inter- racial/ lingual/cultural/gender diversities

(Drexel University School of Education, n. d.)

Times Higher Education (THE) listed top global universities and their R&D investment is somewhat in the following order (not in any particular sequence) – Singapore which invests 3.2% of its GDP in Education, Switzerland which invests 5.2% of its GDP, Denmark (6.4%) Germany (4.8%), Finland (5.7%) Norway (6.7%) which has Renewable Energy and Marine Biology as its areas of focus, South Korea followed by Japan (around 4%) where students are provided with Government aids but are required to be proficient in STEM, robotics etc. It is claimed that China spends the most at 13%. However, the above site does not feature China, and lists Israel as the topmost spender at 5.73% and the list ends with UK spending a little over 3% of country's GDP on R&D. Sweden also has renown as a top education nation with a GDP spend of 7.6%. Notably, not even half of these countries'

students go on to study postgraduation. Public and government spend on R&D in India is at approximately 3% of the GDP with an aspiration to scale up to 6% in the next few years With a sizeable portion of Indian teachers, researchers as well as students contributing to the total outcomes of excellence in education of universities ranked highest in THE or QS studies, one cannot but wonder why these talents chose to migrate. The very first reason that comes to mind is the absence of true meritocracy. Obsession with grades in India is also a considerable roadblock to respect for skills.

(Afzal, 2018) (ReportLinker, 2025) Everyone has to climb a tree to pass the exams.

The reason this is an important consideration in this paper is because it truly exhibits the purpose of a University Education in India. It is not a surprise that University education in India, for the most parts, does not account for contribution to research and development but rather is a continuity of one's graduation level aspirations in the absence of being able to secure a decent employment. Naturally, it is a given conclusion that Graduates from both UG as well as PG Levels of an academic program will covet and command jobs that are similar in profile.

A closer look at UG education almost uniformly reveals a lack of relevancy of curriculum vis a vis industry requirement. Industry 4.0 has left many a university curriculum partially outdated. AI has played havoc with many of the often-used techniques of education and learning, not to mention that many of the skills that are painstakingly developed in the classrooms are unnecessary in the real world because ChatGPT does a better and faster job of it, without a cost.

As a point of reference, one might also append to the above ideas, the findings of an IISc conducted survey-based study on how to AI proof educational practices in the classrooms (Indian Institute of Science, 2024) -

1) AI tools may substitute counsellors/tutors
2) positive Impacts of using AI include Faculty being aware of learners using AI and hence upping the difficulty level of problems assigned.
3) learners encouraged to use AI to solve problems just as they would do in real life/professional life
4) TA's and Facilitators to encourage learners to *augment* and not *substitute* their personal growth using AI.
5) ETH Zurich suggests accepting all AI tools (by teachers as well as students) to consolidate one's own concepts and access global knowledge
6) Cornell University mandates the use of Gen AI which, in any way, is beginning to circumvent, if not substitute the process of learning and assessment in class. But overuse of AI /any technology is proven to *atrophy* the ability to think and create on one's own. Peer and Instructor interaction is also compromised.
7) Faculty and Learners prefer using Gen AI with some considerations such as –
   a) Grading In-Class Assignments, however, this deters them from giving higher order thinking (HOT) problems due to time constraints
   b) Offering take home exams which are a viable option but students have to present their solutions in class the next day, thereby ensuring complete and thorough comprehension – (big sized classes in India are a pain point with this system)
   c) Mandating the acknowledgement of AI tools, if used.
   d) Cal Tech wonders if critiquing content from AI is an option instead of using GAI created content (clearly, blind acceptance of AI curated information cannot be a path to learning)
   e) Inclusion of MI and acknowledging diversity as a resource, which is integral in curating content as well as delivery modes for Sustainable Education. ((https: //drexel. edu/soe/resources/student-teaching/advice/importance-of-cultural-diversity-in-classroom/)

AI as force multiplier works well when the teacher in class:

- Checks content for bias and accuracy
- Checks for alignment with course objectives
- 80% of the work is be done by AI, rest 20% is personal and uniquely creative
- Uses AI to encourage diversity and inclusivity in the classroom.
- Remembers that AI is never up to date, printed content, even less so. Hence it is the lesser of 2 evils.
- Refrains from adding anyone's personal data on any AI platform, which is difficult as many applications requires this as a pre-requisite.
- Let AI design the broader rubric in alignment with the curriculum asks, while allowing for the micro components of the content require curiosity, experimentation, teamwork and challenges.
- Encourages students to use AI, not penalises them. However, some checks are required.

In a future that threatens to substitute humans with artificial intelligence all around, mankind can and should strive to sustain itself by magnifying its humanness. Our creativity, traditional wisdom, imagination and stories need to be the mainstay of our kind. Already high net worth companies are hiring for non-technical skills. Information and knowledge are now redundant. Music, sport, navigating relationships, children, the aged, the differently abled, the inarticulate, the vulnerable etc, are some functions that artificial intelligence is yet to deliver upon. These are the skills to be nurtured via education and evaluated for in adults ready for life or professions (Teaghan, n. d.).

In order to further ensure the sustainability of (Indian) education, certain interventions are required at the *educators*' end. Curricular Content as well as Dissemination Techniques involving andragogy, mindfulness of learners' multiple intelligences (MI), and using AI to enhance the learning experience, as well as maintaining interdisciplinarity of curricular content would go a long way in ensuring sustainability and agility of educational practices. *Teacher-Trainers/Facilitators* ought to receive intensive guidance on disseminating content in ways that are customized while retaining relevance.

Indian education system largely aligns itself with best practices in pedagogy. Whereas one is required to align to the

principles of *Andragogy* ('andra'-adult, 'agogy'-leading) while considering young adults. Malcolm Knowles propounded this as a theory in his lifetime (between 1913-1997). Knowles includes 5 assumptions and 7 principles as he designs his theory that ought to be the foundation of all adult education in India, if it has to be sustainable, of which the following are the most relevant

Some of the assumptions:

- Adults move from subject centredness to problem centredness
- Adults learn differently – practical skills and problem-solving skills
- Adults use their past experiences and knowledge while learning
- Adults often prefer self-directed learning

Some of the principals:

- Adults prefer making their choices
- Teachers are required to only facilitate the adult learning process
- Provide a collaborative learning environment
- Focus on practical learning
- Adults prefer to design their own tests and thresholds

Howard Gardner challenged the traditional concept of intelligence as incomplete and proposed an augmentation with curricular focus on the different intelligences prevalent in class. (TeachHUB Team, 2010) [excerpted as is]

Customizing education to cater to MI in class would include the teacher-facilitator's awareness of student diversity through initial assessment. Once that is ascertained, one would require to tailor content delivery, evaluation, and analyses of outcomes using aural, visual or kinaesthetic learning tools, via, if available, AR/VR resources. Kinaesthetic Learners work best in teams through experiential learning. (Peterson, 2019)

A common refrain that comes up during any discussion on the state of education in India is that there are inadequate number of trained teachers. Malcolm Knowles addresses this lacuna in his andragogy-based approach to designing professional development (Train the Trainer modules or TTT) for such situations.

TTT program trainers and Professional Development (PD) trainers in this field will do well to remember the core ideas of Andragogy:

Adult learners have a need to be self-directing

Readiness for learning increases when there is a specific need to know. "

Life's reservoir of experience is a primary learning resource; the life experiences of others add enrichment to the learning process. "

Adult learners have an inherent need for immediacy of application. "
(Bennett, 2019)

With the advent of self-learning platforms in abundance, teachers could also practice *heutagogy*, which is guiding learners in a self-learning mode.

Cross curricular teaching-learning is advocated by NEP. A strong synergy of STEAM subjects rather than just STEM is considered the best practise to future proof one's education. However, while this appears theoretically sound, there is considerable background work required to implement this in classrooms seamlessly. Instruction Infusions, Assessment Designs, Evaluation Controls – require to be harmoniously synchronized much in advance, so that the learning experience is seamless (Kelly, 2025). Teacher-colleagues involved require to sit together to hold '*discussion*, (plan) *reciprocal teaching, (*design) *graphic organizers*, (curate board) *writing* and *problem solving*'. This is known as the Co-operative Technique'. For *Discussions*, teachers as well as students may practice 'Think-Pair-Share', For *Reciprocal Teaching,* one may use the Three Step Interview, where two pairs interview each other and then summarize their observations for a third pair, who might have questions. In case of *Graphic Organizers,* one may engage in 'Concept Mapping', 'Group Grid', 'Sequence Chain'. *Writing* Assignments may include 'Dyadic Essays', 'Peer Editing'. *Problem Solving* may be encouraged by students creating a problem chart, ideate solutions, discuss and debate the efficacy of each and conclude. Group discussions in '3 stay and 1 stray' format may also elicit results [(SERC at Carleton College, 2009) Initial Publication Date: November 13, 2009].

Non-Linear Learning Strategies work best in mature learners. In this technique, the curricular content, which may be designed as linear modules functions merely as a suggestive framework for actual progression of class content. In case of mature adult learners, the teacher trainer may flip the class, or allow learners to take the initiative of designing content progression dependant on real time professional needs. This promotes learner autonomy, spontaneity, and diminishes rote learning tendencies. Flipped classrooms also swap the established power dynamic of the learning environment. This increases learner engagement and investment in the process of education (Afzal, 2018; Schipperen, 2021).

A typical concern in most Indian classrooms is the overcrowding of student numbers. Resulting from substantial shortage of both qualified teachers as well as adequate infrastructure to deliver lessons, Indian classrooms cannot have the luxury of the global advisory of a 1: 15 teacher: student ratio in class. **Teacher-Student Ratio** in India is far from balanced. One should, however, factor in that oftentimes it is only a solitary teacher for the day that is tasked with the onus of managing the students, teaching, maintaining the institutional sanctity, feeding the learners their midday meals (if the institution is a govt school) and maintaining records for supervisory bodies. (https: //www.geeksforgeeks. org/challenges-in-indian-education-system/), (https: //testbook. com/ias-preparation/indian-education-system-problems-and-challenges)

5. Conclusion

Some concluding observations, then, that shape the study's blue print for a sustainable education system, may be enumerated as follows:

1) Centres of Excellence (CoE) and Skill Development Programs are a significant step in the upskilling of youth and adults in collaboration with industries enhances LFPR.
2) Women should not remain disengaged from employment participation, due to societal pressures and safety concerns
3) Consider educational degrees as well as vocational skills training as equal stepping stones to white collar formal employment. Skilling is not socio-economically inclusive and this sets back the probability of harvesting the demographic dividend. In villages there are sufficient workforce who may contribute to the country's growth if they were skilled, but are left out of the benefits of such initiatives from the Government, which arises out of poor percolation, awareness as well as implementation of policies.
4) It is also seen that those that participate in the trainings and return to the workforce are not adequately compensated for their upskilling. One hesitates to upskill for fear of losing out on facetime at work.
5) The demographic transition of India as the richest nation in terms of maximum working age population, in the world, has begun. The overpopulated country is truly home to the largest working-class people in the planet today, and may continue to remain at this sweet spot for the next decade, despite poor fertility rates in Urban India. [ILO- India Employment Report. (Data of 2024)]
6) If one could ensure upskilling of youth with reference to modern technologies at the pace that technology evolves in, one might reap the dividend of the demographic advantage faster in India.
7) Though literacy rate is more in the Southern States of India than in Central/Eastern etc. parts of the country, a worrying trend is the decreasing population of youth in this part of the world. There are not enough adequately skilled persons in the workforce to feed the needs of the industries here. Hence migration is rampant. Some Indian states like Bihar, Jharkhand, Chhattisgarh, Rajasthan, Madhya Pradesh and Uttar Pradesh – have a substantial working-age population. The population of youth in most southern states, such as Tamil Nadu, Kerala, Andhra Pradesh and Karnataka, is small and expected to decline further. (IHD and UNDP 2021; Srivastava et al.2020).
8) Valuing humans over machine/technology. At the end of the day, humans work best with humans because of the common frame of reference
9) Attach value to aesthetics, emotions, spirituality and spontaneity – that sets apart the human from the machine
10) Emphasize family/society as end user and prioritize the 'we' concept more than the 'me' concept.
11) If the desired outcome is continuity of Humankind on earth, it is best achieved by humans, with a strong sense of responsibility and commitment to the third bottom-line – environment.
12) Encouraging Educators as well as Employers to prioritize EQ instead of IQ since data is abundant but skills in managing it towards greater humane goals is not.
13) A famous business house claims not needing graduation certificates or even resumes from its hires. Skills, attitude and EQ are the only recruitment parameters. This reiterates the emergence of Soft Skills as the key differentiator.
14) Case based Teaching also is a step in the right direction where critical thinking is encouraged. Open ended assignments value creative insightfulness over correctness. Take away 'accuracy focus' and AI becomes less of a threat and more of a multiplier. (Hoyos, 2025; Garrido, 2025)

The processes need to start with the educators. Teachers require first to 'buy in' to the changes proposed. They require focussed upskilling with AI tools and content in order to design, deliver and assess content. Content curation, on the other hand requires a strong reverse engineering process to be designed with the industry, by the industry and for the industry. There is no room for idealistic knowledge gathering that does not hold any monetary value, just for the sake of tradition and culture. However, if one is creative enough to weave such tradition, culture and ethnic values into the learnings, then the curriculum beats AI and obsolescence at the same time. Human attributes of emotion, spontaneity, ethics etc need to be hardwired into the stakeholders of the education process. The triple bottom lines of social, economic and environmental outcomes need a fourth pillar – that of humaneness. The fourth bottom line will ensure the anthropomorphic silo in the education pyramid.

One needs to design Sustainable Education to meet the needs of all its stakeholders, from the humans who disseminate the skill/knowledge with aid of AI, to the processes that consume it. AI requires to be a critical tool to ensure future ready content and facilitate last mile delivery. Any design or concept that substitutes the human factor in educating humans is counter intuitive.

Hence the more the machine learns, the more the humans should dip into their canvasses of joy, pain, critical thinking, visionary ideations and artistic symphonies.

May this blue print of Sustainable Education free up the human hands and minds to conceptualize afresh the next revolution to be *led* by the human but *executed* by the artificial intelligence. The AI proofing of life may well be more existential than impacting only education. If a recruiter prioritizes creativity and innovativeness, resoluteness and resilience, leadership and empathy, the ability for striving for greater human good at the recruitment table, perhaps education will reverse engineer its thrust areas and prioritize the same. One way or another, if the world wishes to see humans as part of its biome, one will use AI to achieve it.

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