
INDIA

THREE YEAR ACTION AGENDA
2017-18 TO 2019-20



NITI Aayog
GOVERNMENT OF INDIA
NEW DELHI

CHAPTER 20.

EDUCATION AND SKILL DEVELOPMENT

- 20.1. While India is expected to become the second largest economy by 2050¹, it will also boast of the world's largest working-age population which is expected to touch 962 million by 2030². Furthermore, India will be the world's youngest country by 2020 with an average age of 29 years³. This "demographic dividend" comes at a time when the rest of the world is ageing where, by 2020, the average age in the United States of America (USA) is expected to be 40 years, for Europe 46 years and for Japan 47 years⁴. Thus, India will not only have a young workforce to fulfil its domestic needs, it also has the opportunity to become the global hub for skilled workforce.
- 20.2. This window of opportunity is also a challenge. The youth of India need education and skills to be able to fulfil their promise and the current systems are ill-equipped to deliver these on a large scale. The following sections touch on the action items needed in the areas of School Education, Higher Education and Skill Development if we are to deliver on this promise.

School Education Vision and Strategy in Brief

- 20.3. The most important goal in front of the Indian school education system today is to improve learning outcomes. Through initiatives like the Sarva Shiksha Abhiyan (SSA) and The Right of Children to Free and Compulsory Education (RTE) Act, the Indian school system has focused on measuring and delivering inputs, and in this, it has largely succeeded. The Gross Enrolment Ratio (GER) in 2015-16 for grades I-V was 99.2% and for grades VI-VIII was 92.8%⁵. Pupil-Teacher ratio at national level for elementary schools was 24:1 and for secondary schools it was 27:1⁶.
- 20.4. Unfortunately, this success in getting more children into schools with more teachers has not translated into more education. The proportion of children in grade III who can read at least a grade I level text dropped from 50.6 in 2008 to 40.3 in 2014, before increasing marginally to 42.5 in 2016 according to Pratham's Annual Status of Education Report (ASER) data. The proportion of children in grade III who can do at least subtraction fell from 39% in 2008 to 25.4% in 2014, and again increased slightly to 27.7% in 2016. Poor learning outcomes are reflected in multiple other sources as well, including the National Achievement Survey (NAS), which found worse results in Class V Cycle 4 (2015) compared to Cycle 3(2012).
- 20.5. These are not the only results, which suggest that a focus on inputs does not help improve education. The most rigorous and credible evidence available to-date shows that the traditional levers – more or better infrastructure⁷, lower pupil-teacher ratios⁸, higher teacher salaries⁹ and more teacher training¹⁰ – by themselves have not been effective in improving student learning outcomes. The most critical missing pieces that evidence has shown to be effective are - pedagogy that focuses on teaching at the right level¹¹, outcome linked incentives¹², and governance that enables the system to operate smoothly¹³. In the next three years, we must focus on introducing changes that help produce improved learning outcomes in the short term as well as lay down the foundation of long term strategic change.

School Education Action Agenda - What Does it Seek to Accomplish and How?

- 20.6. There are three major goals to achieve in the first three years of the action agenda
1. Orient the system towards outcomes
 2. Provide tools to teachers and students for effective learning
 3. Improve existing governance mechanisms and pilot new ones

Orient the system towards outcomes

- 20.7. *Introduce an independent, state of the art sample based outcome measurement system.* One of the most important components of a learning outcome orientation is a credible, comparable measurement system for each child. This is important in and of itself because without credible measurement, there is no awareness of the situation¹⁴ and no possibility of improvement. It also makes it impossible to introduce performance-linked incentives, which have been shown to be highly effective in improving learning outcomes. However, a regular high stakes assessment that involves every child would be a gargantuan undertaking for which the capacity does not exist at this point. Instead, we need to introduce an annual sample-based measurement system that is representative at the state level, independent, technology driven¹⁵ and provides rigorous estimates for the entire population of children (publicly and privately schooled). It is also critical that this assessment starts from grades as early as two or three, because that is the most critical stage of learning. Such a system would have the short-term benefit of allowing states to know how they are doing and aim to improve. One possible method is that the National Achievement Survey (NAS) can be adapted to meet the characteristics outlined above. In the longer to medium term, such a system will help build capacity for a more comprehensive assessment, and provide an independent check of the validity of larger assessments when they start being carried out. It can also be used to pilot larger scale diagnostic assessments for interested states that can help them determine shortcomings in the system and move towards their own larger scale assessments.
- 20.8. *Track and support state level improvement through a School Education Quality Index (SEQI).* Competitive and collaborative federalism can be used as a lever to drive improvements in school quality through tracking outcomes and reforms in a systematic way and making them public knowledge. SEQI will be instituted to collect, systematise and publicise these measurements to drive the orientation towards outcomes.
- 20.9. *Modify RTE requirements on inputs.* The Right To Education (RTE) Act stresses on inputs, causing resources to be focused on things like building schools, hiring teachers, having playgrounds and libraries while learning outcomes have steadily dropped since the introduction of the Act. The RTE needs to be modified to actually become a Right To Learning, instead of being, as it currently is, a Right to go to School. In this context, the recent amendment of Rule 23(2) under the Right to Education Act constitutes an extremely important positive step. The amendment makes it compulsory for all state governments to codify expected levels of learning for students in classes I to VIII. It requires states to prepare “class-wise, subject-wise learning outcomes for all elementary classes” and devise “guidelines for putting into practice continuous and comprehensive evaluation, to achieve the defined learning outcomes.” In implementing this mandate, states should begin by devising their learning indicators and planning a state-level measurement system for every child.
- 20.10. We should also go further in this effort. Gujarat has already shown the way with its rules and regulations for the RTE Act. These rules assign the bulk of the weight to student performance when considering continued recognition of a school. But most states have followed the central government’s template and relied on input norms. To remedy this situation, all the requirements on inputs such as school buildings, playgrounds and pupil teacher ratios should be removed or relaxed to take the form of guidelines, and the focus should shift to outcomes instead. States should be encouraged to deploy resources as efficiently as possible to achieve outcomes. In particular, pedagogically unviable schools with very few students will then be more easily consolidated into larger schools.

Provide tools to teachers and students for effective learning

- 20.11. *Introduce evidence based Information and Communication Technology tools only.* Evidence shows that introducing technology by itself is no panacea. A recent review of evidence finds mixed results with a pattern of no results and even a few negative results¹⁶. This should not be interpreted to mean, however, that all technology-based learning applications are ineffective or harmful. On-going research has offered some indication that computer-based tools that allow children to learn at their own level and pace may be highly effective in pushing up learning outcomes¹⁷. The government should commission further research on such tools on a wider scale, and if successful, they should be adopted.
- 20.12. *Focus on foundational learning.* There is compelling evidence that children who fall behind in basic literacy and numeracy skills in early grades maintain an almost flat learning curve later because the material being taught in class moves past their level and they have no way of catching up¹⁸. A time-bound national program with focus on ensuring that all

children have such basic skills should be launched. Mobilizing the services of local contract tutors who may not possess the qualifications of regular teachers but are nevertheless qualified to impart foundational skills is one possible way of bridging this gap.

- 20.13. *Pilot a system of technology aided adaptive examinations.* Under the RTE, everyone is promoted till Std. VIII and are suddenly required to clear board examinations in higher grades. This leads to student stress and high stakes situations which result in adverse outcomes like preparing for the test and mass cheating. We should pilot a system of technologically enabled “exams on demand” which test students on absolute competencies instead of relative ‘marks’ and allow students to take and re-take exams when they are ready. This can help us study its effectiveness in reducing cheating in exams and also open up the option of ‘second chance’ programs, where those who have dropped out at the elementary level can certify themselves at the higher levels.

Improve existing governance mechanisms and experiment with new ones

- 20.14. *Improve existing governance mechanisms.* The hollowing of public schools makes it abundantly clear that the public school system has not achieved the desired outcomes in the country.

Table 20-1: Hollowed Out Public Schools (2014-15)

Type of public school	Number of schools	Avg. students per school	Avg. spend per child per year	Total teacher salary bill
20 students or less enrolled	~1,00,000	12.7	Rs. 80,000	9,440 cr.
50 students or less enrolled	~3,70,000	29	Rs. 40,800	41,630 cr.

- 20.15. Between 2010 and 2014, public schools increased by approximately 13,500 in number but total enrolment in them fell by 1.13 Crore. In parallel, private school enrolment rose by 1.85 Crore. This shift has been accompanied by hollowing of an alarmingly large number of public schools. As the accompanying table shows, public schools with fewer than 50 students (and an average of 29 students per school) stood at 3.7 Lakh schools in 2014-15. They represented 36% of all public schools⁹. High rate of teacher absenteeism, limited time spent on teaching when the teacher is in class and generally poor quality of education are among important reasons for this emptying out. Outcomes are worse in government schools than in private schools, and those who can leave are voting with their feet. Quality improvement through improved governance is one way of slowing or reversing this process. A set of basic governance processes and structural reforms that have the maximum impact have been identified and included in the SEQI. These include, among others, a focus on school leadership, administrative tenure, basic monitoring by administrators to resolve school level issues such as teacher absenteeism, and transparency in teacher appointments and postings/transfers. Improvements on these parameters included in the SEQI should be the focus of state governments in the short term.

- 20.16. *Pilot new governance mechanisms.* One of the critical changes that needs to be brought about in the governance of the school education system in India is a separation of the functions of policy making, regulation and provision. Currently, all these functions are carried out under the State Ministry of Education which often regulate aspects of private school functioning like school fees in an ad hoc manner. Progressive states should be identified where the separation of these functions can be piloted.

- 20.17. The provision of education can potentially be hived off into a separate publicly owned vehicle, or the directorate of education can be made more autonomous and accountable. The important factors to be kept in mind for such an initiative to succeed are – clear, measurable goals; quality of top managers selected; independence and authority for the management to take necessary steps to reach the goals; and oversight and accountability based on credible measurement of outcomes.

- 20.18. In terms of regulation, states should regulate only based on outcomes and transparency requirements, not through

regulating inputs like library, fees and playground. Both private and government schools should be regulated in the same way.

- 20.19. *Explore the role for private players.* A working group should be set up with states' participation to explore and pilot other bolder experiments by interested states. These could include education vouchers and local government led purchasing of schooling services. Public-Private Partnership (PPP) models could also be explored where the private sector adopts government schools while being publicly funded on a per child basis. This latter instrumentality may provide a solution to the problems of schools that have hollowed and are incurring massive expenditures per pupil currently (see above).

Higher Education Vision and Strategy in Brief

- 20.20. In higher education, we face a similar challenge to school education. We have made significant progress in increasing enrolment – the GER in tertiary education has risen from 20.8% in 2011-12 to 24.5% in 2015-16 and is more than double what it was only 10 years ago²⁰. However, we need to drive higher quality in the system. To give an indication of the magnitude of the challenge, an assessment of 150,000 engineering graduates²¹ in 2016 found only 18% of engineers were employable in the software services sector in a functional role, only 41% in non-functional Business Process Outsourcing and only 4% in software engineering start-ups.
- 20.21. When we look to successful higher education systems across the world, we find that less regulation and more focus on autonomous governance, transparency and outcomes are critical components of a vibrant and successful higher education sector, and these should be the basis of our strategy.

Higher Education Action Agenda – What Do We Seek to Accomplish?

- 20.22. The major actions to be completed over the next three years are:

1. Designation of World Class Universities
2. Autonomy for top colleges and universities
3. Reform of the regulatory system – A tiered system of universities
4. Establish system of project/researcher specific research grants
5. Increased focus on vocational and profession led education

- 20.23. *Designation of World Class Universities.* Identify 20 universities (10 public and 10 private) that can be immediately moved out from the regulatory system. Creating world-class universities requires autonomous governance, focused funding, and oversight based on independent outcomes like world rankings. Here we can learn from China's and Singapore's attempt to create world-class research universities. China chose a tiered system under which two Tier 1 universities – Beijing and Qinghua - received significantly higher funding. Singapore too funded its top two universities – National University of Singapore and Nanyang Technological University - very liberally. We too should be careful that we do not spread available funds too thin. Instead, we should adopt the tiered funding model for public universities whereby the two best public universities are provided significantly higher funding (with commitment to deliver correspondingly large improvements in performance) than the remaining eight chosen public universities. The most promising candidates should receive the most funds and be accountable for outcomes, while receiving the same flexibility in governance as any university worldwide. Chosen private universities should also be provided the same level of autonomy though no public resources need be offered to them.

- 20.24. *Autonomy for top colleges.* More established colleges should be brought under the autonomous colleges scheme to take them out of the centralized control of their university and provide greater flexibility in academic matters. Selectively, we should also offer colleges with postgraduate teaching, excellent track record and commitment to promoting excellence in teaching and research the option to convert into unitary universities. This will allow the colleges to develop their brand name and compete more effectively for good students and teachers. The Presidency College, which recently converted to Presidency University, offers a good example in this respect.

- 20.25. *Reform of the regulatory system - A tiered system of universities.* The University Grants Commission (UGC) Act, 1956 is in dire need of reform. The UGC's position as an overarching regulator of every aspect of higher education from student fees to curriculum to teaching and course hours keeps India's higher education system from responding to the changes and challenges that it faces in a fast evolving world. Various professional councils further complicate the regulatory environment in higher education. We should introduce a system of regulation that focuses on information disclosure and governance rather than micro management of universities. This requires an overhaul of the UGC as a regulatory system and a rationalization of the role of professional councils.
- 20.26. But even within the existing legal framework, it is possible to make progress. We should introduce a tiered system whereby the top research-focused universities, which promise to compete globally, are given full autonomy and promised additional resources based on significant improvements over time. These universities may be subject to high standards of transparency with full freedom granted in operational matters such as courses, curriculum, teaching hours and pedagogy. Quality should be enforced through periodic third party assessments. As mentioned in the Science and Technology chapter as well, the universities must also be given autonomy to attract research staff from abroad or local research bodies to create a critical mass of research faculty in specific areas. They must also be encouraged to compete for research projects from industry. The objective should be to eventually move research from falling solely under the purview of research institutes and councils to also being encompassed by research universities.
- 20.27. A second tier of universities with employment-focused education can be subject to light regulation. These universities would be expected to use the flexibility given to them to adjust admission policies, curriculum and courses to respond to shifts in job composition in the marketplace. They will also be evaluated according to their success in job placements of their students.
- 20.28. The last tier of the universities, whose primary function would be to ensure that higher education is available to all who want it would be the most regulated one. This tier will consist of the universities that are currently performing poorly and not likely to perform well on either research or employment dimension. While this tier can receive greater scrutiny from the UGC, there is a need for loosening control here as well with priority given to transparency.
- 20.29. The system should provide flexibility to universities that improve performance to move to higher tier. Universities in the first two tiers, which repeatedly fail to meet the minimum standards, should also face the prospect of losing their coveted classification. Colleges and universities in the third tier that repeatedly do poorly in quality assessments should be considered for closure.
- 20.30. While the legal framework should eventually be altered to give the tiered system legal cover and to insulate it from the possibility of a return to the current regime under a different future leadership, it is possible to begin moving towards this system under the current legal framework of the UGC Act. A key drawback under the UGC Act is that it would not provide sufficient assurance to universities of their status within a particular tier. The fear that the status may be changed on the whim of an administrator would remain. An eventual change in the law would be required.
- 20.31. Besides these actions, reform at the state level is also required and should be carried out through incentivization by the Rashtriya Uchchar Shiksha Abhiyan (RUSA). These reforms should also encourage autonomy and good governance practices in universities in the state level regulation of higher education. States need to give state universities greater autonomy and reduce interference in their day-to-day functioning.
- 20.32. *Establish a system of project- and scholar-specific research grants.* A system of public funding for research in specific areas of public importance has driven much of the innovation in science and technology in other countries. A similar system should be set up in India with funding to specific scholars, thus, providing both maximum flexibility and accountability for results. Another model that should be adopted is the 'prize' system with funding going to research/innovation groups that deliver solutions to clearly specified problems. Such a system can be used in the future to drive innovation and research, solve pressing problems, and provide a mechanism for competition and quality assurance.
- 20.33. *Increased focus on vocational and profession led education.* We should establish and promote norms/standards and/or outcome based certification for institutions that focus on skills and trades closely tied to employment. We should also include vocational subjects in mainstream universities to allow for greater acceptance and utility for vocational learning. We can focus more in particular on those skills that are expected to be in high demand from the public sector in the coming years. Examples include public health workers, foundational skills teaching, nursing and paramedics.

Skill Development

- 20.34. Estimates suggest that only 2.3% of India's workforce has undergone formal skill training compared to United Kingdom's (UK) 68%, Germany's 75%, USA's 52%, Japan's 80% and South Korea's 96%²². This has led to large sections of the workforce having insufficient job skills. Furthermore, according to estimates for the period 2013-2014, India's annual skilling capacity at approximately 7 million²³ is significantly lower than the workforce entering the market annually. Additionally, as noted earlier, the quality of skills imparted in the existing facilities in India is also a matter of concern. A large proportion of our engineers can simply not be employed as engineers.
- 20.35. The Government of India has recognized the exigency of implementing large scale and effective skill development solutions with a number of initiatives having been undertaken over the years. In 2008, the then Prime Minister set up the three tier structure called the "Coordinated Action on Skill Development" which included (i) the PM's National Council which set a vision for 500 million skilled people by 2022, (ii) the National Skill Development Coordination Board (NSDCB) which coordinated the skill development efforts of various government departments and (iii) National Skill Development Corporation (NSDC) which is a unique Public Private Partnership (PPP) body that implements various skill development programs²⁴. Although the National Council and the NSDCB were subsumed into the National Skill Development Agency (NSDA) in 2013, the NSDC is still a key agency working on skill development in India.
- 20.36. The creation of a new Skill Development ministry in 2014 marked a paradigm shift in skilling, moving it to a new trajectory. The Skill India Initiative was launched in 2015 which aims to equip 40 Crore people with employable skills by 2022²⁵. This initiative includes key government schemes on skill development like National Policy for Skill Development and Entrepreneurship 2015, Pradhan Mantri Kaushal Vikas Yojana (PMKVY), National Skill Development Mission and the Skill Loan Scheme. Increased allocations of Rs. 4,500 Crore to the Deendayal Antyodaya Yojana - National Rural Livelihood Mission and the launch of Skill Acquisition and Knowledge Awareness for Livelihood Promotion Programme (SANKALP) with an outlay of Rs. 4,000 Crore in Budget 2017-18 highlight the government's continued commitment towards skill development²⁶.
- 20.37. Despite numerous initiatives that have been undertaken till date, we are still faced with a daunting challenge of training a large workforce. It is estimated that the demographic dividend is expected to last for 25 years²⁷. Thus, to reap the benefits of this one-off opportunity India needs to significantly scale up its skill development initiatives ensuring quality and speed with efforts from both the private and the public sector. The Action Agenda identifies initiatives that need to be undertaken over the next three years to complement the existing policies.
- 20.38. Apprenticeships are an effective mechanism for skill development as they offer efficient industry relevant training. The Government of India has set a target for training 50 Lakh apprentices by 2020²⁸. While numerous measures are suggested in the National Policy for Skill Development and Entrepreneurship, 2015, some further steps may be taken over the next three years to supplement these policy initiatives and help achieve the government targets.
- 20.39. In particular, the quality of outcomes from apprenticeship courses could be enhanced with increased transparency and robustness of the training along with better assessment and certification procedures. This can be achieved by:
1. Encouraging trade areas offering longer term courses to enable educational certification in parallel.
 2. Mandating educational institutions to recognize skill certifications and provide for upward mobility or lateral movements.
 3. Sector Skills Councils with Qualification Packs (QP) and National Occupational Standards (NOS) that are not yet aligned to the National Skills Qualifications Framework (NSQF) should be required to cover all job roles in their sector over the next three years.
 4. Industries represented by the Sector Skill Councils (SSCs) should be responsible for constantly updating the QPs and NOS to stay abreast with international requirements. Costs incurred could be funded under PPP mode.
- 20.40. Currently we do not have an independent regulator overseeing the various skill development initiatives in India. The Ministry of Skill Development and Entrepreneurship (MSDE) is acting as both policy setting and regulation body. Over the next three years, a skill assessment board should be set up at arm's length distance from the government.

20.41. According to the Skill Development Sector Achievements report, December 2016²⁹, NSDC partners skilled 24.9 Lakh people of which 12.0 Lakh were placed in 2014-15. This translates to a placement rate of below 50%. It is recommended that a target of a placement rate for 80% or more should be set for 2020. Furthermore, all NSDC partners should be required to report on the additional metrics recommended in the report titled “Youth Empowerment through Skill Development” by S Ramadorai³⁰. The following indicators could also be used to report on the aggregate performance of NSDC:

1. Per cent of Certified Candidates employed
2. Longevity of certified candidate in their chosen job field
3. Wage difference between certified and unskilled candidates
4. Number of entrepreneurs created through the vocational training ecosystem
5. Number of certified candidates employed in overseas vocational jobs

20.42. All government Departments and Ministries should promote the availability of a young skilled workforce as India’s key asset across the world. A national level Overseas Employment Promotion Agency (OEPA) should be set up under the Ministry of External Affairs to consolidate all the promotional initiatives of the government. This agency would also serve as the nodal agency for identifying potential partners around the globe, areas where skill gaps exist globally and establishing agreements with other countries. It would also help streamline the efforts of an increasing number of India International Skill Centres (IISCs) which are being set up across the country. Bilateral Memorandum of Understanding (MOUs) / negotiations with countries should focus on agreements which include skills training, skill certification and skilled labour mobility.

20.43. The skills and expertise of Indian citizens living overseas or returning to India should be recognised and exploited. Furthermore, there should also be a separate focus on the skills offered by foreign immigrants in India. These people offer global experiences and perspectives. The government should set up a database that records their skills and knowledge with a view to offering them opportunities to contribute to skill development in the country. Dedicated communication channels should be set up with the Indian Diaspora to ensure effective promotion of the opportunities that exist in India. This would also be useful in fostering innovation. Recognition and awards associated with this contribution should also be explored.

20.44. In parallel with the Recognition of Prior Learning (RPL) initiative launched with PMKVY, the identification of transferable skills should also be established as an area of focus. This can be addressed through:

1. Developing a matrix of skills that are transferrable across sectors and trades
2. Making these technological and vocational skills that are transferrable across occupations an integral part of the basic skill development curricula across sectors

20.45. The role of NSDC needs to be delineated better. The envisioned role for the NSDC, according to its website³¹, is that of an enabler for building skill development institutions. Currently, NSDC’s bandwidth is consumed by managing the PMKVY, which primarily does not address the higher levels of skilling or market led, non-sponsored skilling programs. Capacity within the NSDC may be supplemented in the form of a dedicated cell for PMKVY so that the main body of NSDC can focus on its envisioned role.

Sector Specific Action Points

Creative and Cultural Sectors

20.46. India boasts of a rich and diverse culture but formal skill development for cultural industries lags other sectors. Building a skilled labour force in this sector would contribute to job creation, protect cultural practices and heritage, and create livelihood for artisans with traditional skills. Skill development in the cultural sector should be promoted by setting up a dedicated SSC for the same. This SSC would include skill development in Archaeology, Archival Studies, Conservation, Museology and performing arts, among other fields. We should consult with stakeholders to identify skills from different parts of India (a national cultural skill mapping has already been proposed by the NSDC³²) and

select the appropriate experts in these sub-sectors. Skill development programmes should also be developed with a view to make associated skills commercially viable.

20.47. Traditional knowledge systems should also be strengthened by developing curricula for creative industries at tertiary institutions and certification programs.

20.48. In addition to providing skills through the Handicrafts and Carpet Sector Skills Council, selected youth with background in handicraft and weaving should be given government support to further develop their skills in eminent institutions like the National Institute of Design or the National Institute of Fashion Technology. This would give these young artists the requisite skills to fuse traditional handicraft practices with contemporary design sensibilities.

Other industries

20.49. **Gems and Jewellery Sector.** Various measures including increased investment in skill training via co-financing with larger firms, establishing trainer courses and adoption of RPL among others are proposed. Further details are included in the “Trade, Industry and Services: Creating Well-Paid Jobs” chapter.

20.50. **Automotive Sector.** An increased focus on the skill development agenda in the automotive sector will help tackle the low productivity of Indian workers in automotive firms.

Table 20-2: Key Action Points with Timelines for School Education

Area of Action Agenda	Deliverable	Nodal agency	Stakeholders	Timeline
Orient system towards outcomes	Introduce state of the art sample based state level learning outcome test	MHRD	NITI Aayog, State governments	December 2017 and then every year
	Introduce SEQI to measure and compare states on reform and improvement	NITI Aayog	MHRD, state governments	March 2018
	Modify RTE requirements on inputs and change towards outcomes	MHRD		March 2018
Provide tools to teachers and students for learning	Commission large scale studies for evidence on ICT tools	NITI Aayog	MHRD, State governments	September 2017
	National mission for foundational skills learning	MHRD	State governments	March 2018
	Pilot a system of technology aided adaptive examinations	MHRD	State governments	March 2019
Improve governance mechanisms	Start tracking improvement in governance mechanisms as per SEQI	NITI Aayog	MHRD, State governments	September 2017
	Introduce new governance reforms	NITI Aayog	MHRD, State governments	March 2020
	Constitute working group to explore bold reforms of public private partnerships in education sector	NITI Aayog	MHRD, State governments	September 2017

Table 20-3: Key Action Points with Timelines for Higher Education

Deliverable	Nodal agency	Stakeholders	Timeline
Designate 20 World Class universities	MHRD	Top public, private universities	September 2017
Introduce three- tiered system of regulation	MHRD	Universities, state governments	March 2018
Introduce researcher/project based research funding	MHRD		March 2018
Allow vocational courses in mainstream colleges	MHRD	UGC	September 2017
Introduce outcome based norms and certification processes for vocational training in important sectors	MHRD		September 2017

¹ CII Skill Development Initiatives. Source: <http://www.cii.in/uploads//CIISDFinalreduced766.pdf>

² Skilling India – The Billion People Challenge. Source: https://www.crisil.com/pdf/corporate/skilling-india_nov10.pdf

³ EY and FICCI, “Reaping India’s promised demographic dividend – industry in driving seat”. Source: [http://www.ey.com/Publication/vwLUAssets/EY-Government-and-Public-Sector-Reaping-Indias-demographic-dividend/\\$FILE/EY-Reaping-Indias-promised-demographic-dividend-industry-in-driving-seat.pdf](http://www.ey.com/Publication/vwLUAssets/EY-Government-and-Public-Sector-Reaping-Indias-demographic-dividend/$FILE/EY-Reaping-Indias-promised-demographic-dividend-industry-in-driving-seat.pdf)

⁴ National Policy for Skill Development and Entrepreneurship. Source: <http://www.msde.gov.in/assets/images/Skill%20India/policy%20booklet-%20Final.pdf>

⁵ <http://udise.in/Downloads/Trends-ElementaryEducation-2015-16/All-India.pdf>

⁶ http://mhrd.gov.in/sites/upload_files/mhrd/files/Student-Teacher%20Ratio.pdf , based on U-DISE data.

⁷ Muralidharan, Karthik, Jishnu Das, AlakaHolla, Michael Kremer, and AakashMohpal, “The Fiscal Costs of Weak Governance: Evidence from Teacher Absence in India”, UC San Diego/Borkum, Evan, Fang He, and Leigh Linden, “School Libraries and Language Skills in Indian Primary Schools: A Randomized Evaluation of the Akshara Library Program”, 2010, Columbia.

⁸ Banerjee, Abhijit, Shawn Cole, Esther Duflo, and Leigh Linden, "Remedying Education: Evidence from Two Randomized Experiments in India." Quarterly Journal of Economics no. 122 (3):1235-1264, 2007.

Muralidharan, Karthik, Jishnu Das, AlakaHolla, Michael Kremer, and AakashMohpal, "The Fiscal Costs of Weak Governance: Evidence from Teacher Absence in India" UC San Diego, 2013.

⁹ Kingdon, Geeta, and Francis Teal, "Teacher Unions, Teacher Pay and Student Performance in India: A Pupil Fixed Effects Approach." Journal of Development Economics no. 91 (2):278-288, 2010.

¹⁰ Muralidharan, Karthik, and VenkateshSundaraman, "Teacher Performance Pay: Experimental Evidence from India." Journal of Political Economy no. 119 (1):39-77, 2011.

¹¹ The Support to Rural India's Public Education System (STRIPES) trial: a cluster randomised controlled trial of supplementary teaching, learning material and material support. PLoS One. Jul 16;8(7):e65775, 2013. doi: 10.1371/journal.pone.0065775. Print 2013

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¹² Muralidharan, Karthik, and VenkateshSundaraman, "Teacher Performance Pay: Experimental Evidence from India." Journal of Political Economy no. 119 (1):39-77, 2011.

Muralidharan, Karthik, Long Term Effects of Teacher Performance Pay: Experimental Evidence from India. UC San Diego, 2012.

¹³ Muralidharan, Karthik, Jishnu Das, AlakaHolla, Michael Kremer, and AakashMohpal, The Fiscal Costs of Weak Governance: Evidence from Teacher Absence in India. UC San Diego, 2013.

¹⁴ While ASER has done sterling work in bringing attention to the status of learning outcomes in the Indian system, it has been limited in its scope and its acceptance within the government.

¹⁵ The system must be technologically driven to permit capabilities that pen and paper based tests do not possess - adaptive testing to prevent domination of floor/ceiling effects, quick turnaround times for results and building up of capabilities and questions that promote the long term goal of credible measurement for each child

¹⁶ Bulman, G. and R.W. Fairlie, “Technology and Education: Computers, Software and the Internet,” in Eric Hanushek, Stephen Machin, and Ludger Woessmann, eds., Handbook of the Economics of Education, Elsevier, pp. 239–280, 2016.

¹⁷ Muralidharan, Karthik, Abhijit Singh, Alejandro Ganiman “Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India” NBER Working Paper No. 22923, 2016. <http://www.nber.org/papers/w22923>

¹⁸ Muralidharan, Karthik, and YendrickZieleniak, Measuring Learning Trajectories in Developing Countries with Longitudinal Data and Item Response Theory. UC San Diego, 2013.

¹⁹ Geeta Gandhi Kingdon, “Put the onus on teachers”, Indian Express.

²⁰ All India Survey of Higher Education 2015-16 and World Bank

²¹ Aspiring minds employability report

²² National Skill Development Mission - Implementation Plan. Source: <http://www.skilldevelopment.gov.in/assets/images/Mission%20booklet.pdf>

²³ National Skill Development Mission - Implementation Plan. Source: <http://www.skilldevelopment.gov.in/assets/images/Mission%20booklet.pdf>

²⁴ Planning Commission, “Enhancing Skills and Faster Generation of Employment”. Source: http://12thplan.gov.in/12fyp_docs/9.pdf

²⁵ Press Information Bureau, “18,000 plus ITI graduating students received job offer letters on the occasion of World Youth Skills Day”, July 2015.

²⁶ Budget Speech 2017-18. Source: <http://indiabudget.nic.in/ub2017-18/bs/bs.pdf>

²⁷ National Policy for Skill Development and Entrepreneurship. Source: <http://www.msde.gov.in/assets/images/Skill%20India/policy%20booklet-%20Final.pdf>

²⁸ Press Information Bureau, “Cabinet approves the National Apprenticeship Promotion Scheme”, July 2016.

²⁹ Department of Industrial Promotion and Policy, “Skill Development Sector, Achievements report”, December 2016. Source

http://dipp.nic.in/English/Investor/Make_in_India/sector_achievement/Make_in_India_Skill_Development_Sector_Achievement_Report_22122016.pdf

³⁰ <http://www.nsdcindia.org/sites/default/files/files/pdf/SD%20Report%20281014.pdf>

³¹ NSDC Role. Source: <http://www.nsdcindia.org/our-role> as seen on 25.03.2017

³² Expression of Interest for Cultural Skill Mapping. Source: http://www.nsdcindia.org/sites/default/files/files/EOI_Cultural_Skill_Mapping.pdf