Detailed Project Report for the Assam Skill University

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Executive Summary

Assam sharing its border with seven states and two neighbouring countries is the largest state in the North East in terms of Population and is considered to be the gateway to the North East India. It has a growing economy couple with a potential demographic advantage. The state's skilling ecosystem has evolved over the last few years but is mired with some challenges which makes the idea of skill training non-lucrative such as lack of an integrated education and skilling approach, inadequate training infrastructure, shortage of quality trainers and instructors, inadequate strategy to reach out to candidates, limited industry interface, etc. Taking cognizance of these issues and challenges, the State's Legislative Assembly passed the Assam Skill University Bill for establishing Assam Skill University (ASU) in August 2020. The University is expected to serve as a one stop TVET solution for the entire north eastern region of the country and also cater to skilling needs of industries in neighbouring countries.

The state skill university would formalise the TVET ecosystem with focus on work-integration as well as lifelong training with multiple entry and exit points between vocational education, general education, technical education and job market. The permanent campus of the ASU will have close to 83 acres at its disposal in Mangaldoi, the district headquarters of Darrang district. It will be a home away from home for student with close proximity to Guwahati, giving faculty and staff the option of commuting from the city.

This Detailed Project Report has been developed to chalk out the nuances of the Assam Skill University. The first section provides an introduction to Assam Skill University and skilling ecosystem, detailing out the socio-economic, demographic, labour market aspects of Assam, Indian and Assam skilling ecosystem, rationale for setting up ASU, its vision, mission and objectives and ends by giving a snapshot of the roadmap and ASU's infrastructure. The second section details out the methodology adopted for preparing the DPR listing all the steps that have been undertaken to meet the study objectives. Triangulating the key output from the secondary and primary analysis undertaken, 13 Schools and Centres have been shortlisted which are delved in section 3 of the report. The section 4 of the report covers key aspects of the recommended operating model of the Assam skill University starting from the overall conceptual academic delivery model, to the type of programs and pathways that they will provide to students, identified potential target segments, entry-exit points, overall curriculum development framework, credit framework, assessment and evaluation methodologies, TVET teacher development framework, mobilization and outreach strategies and focus on research and innovation. Considering that there is a strong imperative in all general education and TVET institutes and universities to lead in engagement with the industry, other institutes (national and international), SSCs, accreditation and affiliation partners, section 5 lists out the recommended strategies and mechanisms for forging such partnerships along with an indicative list of potential partners. The prerequisites for participating in World Skills Competition and preparing students for this national and international level skills competition has also been delved in this section of the report.

The sixth section of the report delves into governance, administrative mechanism and an indicative organogram of ASU and also details out the roles and responsibilities of each officer recommended for the university. The best practices resulting from shortlisted national (including Assam based institutions) and international institutions and advanced States in India have been charted out in section 7 of the DPR. Since financial sustainability of the proposed university will play a significant role to provide an enabling environment for its progress and success, the detailed financial model and the key revenue streams considered for the university have been highlighted in section 8 of the report. The DPR ends with listing out the year wise key activities which need to be undertaken to operationalize the ASU by incorporating suggestions provided in the DPR over the 10-year period. A brief summary of some of the critical elements of the DPR are provided in subsequent pages:

Methodology

A multi-fold methodology was adopted to develop the DPR for the Assam Skill University. The overall methodology adopted was a mix of '**Research oriented'**, involving secondary research such as the review of the economic and skills context of the state, Assam skill gap report to identify the sectors having maximum incremental demand as well as a review of regulations to develop various aspects of the business model, operating model, governance structure etc. and a detailed review of international and national best practices to draw relevant learnings. The process has also been '**Consultative**', engaging with ASDM and ADB team members, 11 Assam based institutions and 10 sectoral experts/industries.

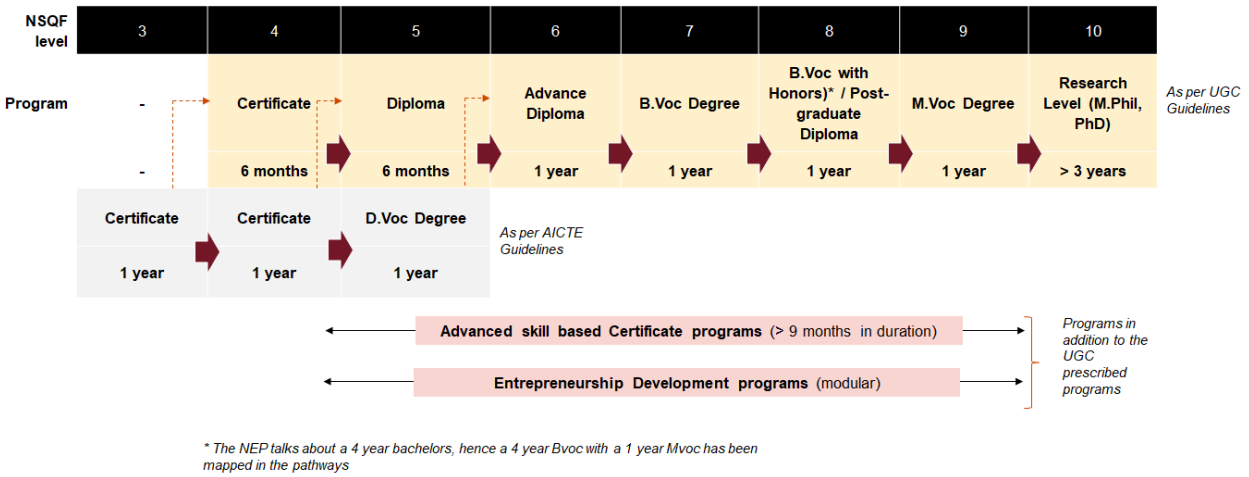
Schools, Centres and their focus areas

The table below provides an overview of the recommended schools and centres and their focus areas. The focus areas will be updated, added or validated by a thorough market research and critical inputs from the industry and academic experts.

Potential Schools/ Centers	Focus areas
School of Agricultural and Food Technology	Agriculture and Food Technology Tea Bamboo Technology Horticulture (including spices) Animal Husbandry, Sericulture and Fisheries
School of Technology	Information Technology Data Analytics, AI and Cloud New age Technologies
School of Design and Creativity	Design Media and Communication Studies
School of Manufacturing and Construction	Mechatronics and Robotics Engineering O&G Electronics Metal technology Building and Construction
School of Sustainability	Climate change, Environment and Sustainability
School of Mobility	Logistics and Supply Chain Ports and Inland Water Transport Civil Aviation
School of Management and Finance	Management Banking, Insurance and Financial Services
School of Tourism, Hospitality and Wellness	Tourism and Hospitality Wellness
School of Healthcare	Healthcare and Health Technology
Center for Entrepreneurship and Innovation	Focus on start-ups, entrepreneurship for grassroots and incubation
Center for Life Skills and Languages	Focus on developing soft skills modules and English language modules

Potential Schools/ Centers	Focus areas
Center for Lifelong Learning (distance learning and online learning)	Focus on coordinating with other schools and running distance and online programs[1]
Center for Faculty and Curriculum Development	Focus will be to undertake capacity building and research on enhancing quality of in-house and external TVET faculty. Further, focus on developing innovative curriculum pedagogy in collaboration with the industry, SMEs, SSCs, etc.

The recommended pathway charted below for ASU provide students flexibility to enter and exit at the end of each year with an equivalent degree/diploma/certificate. Further, it provides opportunities for mature students to take up credits for upskilling as well. Moreover, the recommended pathways offer students the flexibility to complete additional credits (if any) to obtain a degree/diploma as guided for a specific program.



** The NEP talks about a 4 year bachelors, hence a 4 year Bvoc with a 1 year Mvoc has been mapped in the pathways*

It can be noted that there may be two potential pathways (Bachelors of Vocation (B. Voc) and Masters of Vocation (M. Voc) as developed by UGC and Diploma in Vocation (D. Voc) pathway as developed by AICTE) that may be integrated with each other at the Assam Skill University. As a result, students will have the option of flexible entry and exit after completing each certificate/degree/diploma.

Further, advanced skill-based Certificate programs and modular entrepreneurship programs may be developed and undertaken at the university. These programs shall be curated based on existing units/modules or additional modules (as recommended by the industry partner or academic experts) for the B.Voc to Research Pathway, therefore giving flexibility to students in terms of choosing to study specific topics, diploma, or degree. It is an indicative pathway and may evolve once revised UGC guidelines are notified based on the National Education Policy (NEP) 2020.

Operating model

This section covers the following aspects of the operating model of the Assam Skill University.

Academic delivery model

The model has been proposed in alignment with national regulations, quality framework proposed by NAAC and QCI, NIRF as well as Indian and international best practices. Further, it has been envisioned based on the larger guidance provided by the National Education Policy 2020 that aims to reforms the education ecosystem in India. The key elements or principles of the academic delivery model envisaged

[1] As per the UGC Online Education Regulations 2018, it is required for an institution to have been in existence for atleast 5 years and accredited by NAAC to run online programs.

for ASU include problem based and collaborative learning, work based learning, live labs, practical learning and blended form of learning. It is suggested that all the programs/training courses are delivered mainly through a classroom-based teaching as this would enable better interaction between faculty/instructors/trainers and students and lead to more involved learning. Further, most of the training courses would also require better visualization of the concepts taught, an additional use of simulations, laboratory assignments and field training.

Student target segments

As a university, ASU may target students from a variety of backgrounds and geographical regions with key focus on women, students with disabilities and from backward communities, especially tribal belts to promote inclusive learning. The potential target audience for the skill university include:

- School drop-outs, 10th Pass
- 12th pass
- Skill trained youth
- ITI graduates
- Polytechnic graduates
- Bachelors and Masters graduates
- Entrepreneurs - aspiring and existing
- Employed applicants

Further, applicants are envisaged to apply from within Assam, the rest of India (especially the neighboring north-eastern states) and international students (from countries such as Bhutan, Nepal, Bangladesh, etc.).

Curriculum development framework

The suggested framework would enable the skill university to articulate not only what students will learn but also describe the process of how they will learn, be taught and assessed irrespective of the course/programme and will help drive pedagogical innovation. In addition, it is suggested that ASU considers gender sensitivity, indigenous community and PWDs lens while designing the curriculum and pedagogy framework to avoid gender stereotypes, remove barriers and improve outcomes. The proposed framework consists of six steps with seven integrated elements aligned to the principles of the academic delivery model and it must be noted that each step is not meant to be linear and that each step may overlap or be run parallelly with other development activities.

Credit framework

ASU's credit framework will be aligned with relevant regulations and guidelines as well as the larger guiding framework provided by the National Education Policy (2020). Ministry of Human Resource Development. It will ideally include the following features:

- Semester based system (comprising about 18 weeks each)
- Multiple entry and exit options
- Maximum of 70:30 split of credits across the skill and general component (as mandated by UGC)
- Integration of apprenticeship opportunities across the programs
- 30 credits per semester (i.e. 60 credits in a year)
- Choice-based credit system[2] and provide provisions for credit transfer across courses

Assessment, Evaluation and Remote learning framework

[2] This will allow for flexibility in the education system, so that students depending upon their interests and aims can choose interdisciplinary, intra-disciplinary and skill-based courses (UGC Guidelines on Minimum Course Curriculum For Undergraduate Courses Under Choice Based Credit System)

It is recommended that the skill university adopts a combination of formative (oral presentation and exams, take home exams, lab work, projects, clickers in class) and summative (written and practical exams) assessments with completely different evaluation methodologies to be explored for persons with disabilities depending on their disability type. The grading system would be such that it converts marks obtained into grades on the basis of pre-defined class intervals and for the same UGC recommended 10-point grading system can be used. For apprenticeship integrated in the D.Voc, B.Voc or M.Voc pathway, the assessment mechanism is suggested to be as per the UGC Guidelines for Higher Education Institutions and PhD students can be evaluated based on the UGC outlined norms in the (Minimum Standards and Procedure for Award of M.PHIL./PH.D Degrees) Regulations, 2016.

In order to develop online education delivery capabilities, ASU can consider having ICT and blended form of education from the very beginning for seamless trainee experience. A comprehensive Learning Management System designed to identify training and learning gaps, utilizing analytical data and reporting, would be a key platform for online content, including courses and delivering and managing all types of content, including video, courses, and documents. Learning management solution will help to cater all needs around trainings that will be imparted in ASU such as – Training plan, calendars, circulars, attendance, live classes, digital content etc. Additionally, in order to run UGC aligned online diploma or degree programs, ASU must be cognizant of UGC's eligibility criteria that any higher educational institution, must fulfil for offering such programs.

Inclusive learning at ASU

ASU as a university is recommended to strive towards an inclusive educational environment, attract, retain and develop a diverse student and staff community and ensure that campus is inclusive and accessible for everyone to achieve their full potential. The inclusion framework envisaged for ASU outlines its focus on creating an environment that promotes gender equality and inclusion of the socially vulnerable by mapping the aspirations, principles and goals. It lays stress on women, tribal communities, backward communities and specially abled students and teachers.

TVET Teachers' Training Model

All TVET trainer capacity building interventions are recommended to be anchored by the Center for Faculty and Curriculum Development in Coordination with the Human Resources and Academic Department. In addition to training in-house trainers, the Center for Faculty and Curriculum Development can be established to innovate with curriculum and help address the shortage of quality trainers in the TVET system. It can consider offering training of trainers to enhance the pedagogical and technical competencies and leadership skills of TVET trainers, provide services in curriculum designs and development, and deliver learning resources and materials. Thus, it is suggested that TVET trainer capacity building interventions can be across 3 broad areas, these are: Professional Development Plans for TVET trainers, Teacher Mentoring and Technical training programs for TVET trainers.

Research and Development and Innovation Strategy

Center for Entrepreneurship and Innovation is suggested to promote entrepreneurship and technology innovation opportunities for trainees and others in the state by providing entrepreneurship training, mentoring, support for business incubations, and facilitation for market linkage and financing. The centre can also focus on cluster based micro-entrepreneurship, small and medium business and technology start-ups. The centre can provide an integrated quality support system in collaboration with reputable national and international institutes. The centre may also house a technology innovation hub which will work in collaboration with the School of Technology and the School of Manufacturing and Construction. In addition, it is suggested to have a Skills Research and Development Hub to provide various skill-related research and services, including updated Labour market information on skills demands, emerging skills training programs, career guidance and TVET training information, among others.

Student mobilization and admission Strategy

The approach has been divided into two phases: Pre-Selection: IEC and Mobilization and Selection: Admission Test/ Screening/ Pre-Assessment, Counselling and Enrolment. The Push and Pull strategies' will be critical in devising the IEC plan. Pre-Selection strategies for the different student target segment envisaged at ASU has been detailed out in the report. In addition, while the student selection models will depend on the type of program/course, it is recommended to mandatorily have an online test that could be conducted in dedicated test centres across Assam, neighbouring states and countries with program specific eligibility criteria declared in open forum. ASU can take help from an Implementing Agency to monitor the test.

Career Support and Placement Strategy

A Career Development Center (CDC) is recommended to be established at ASU which would play a wider role to improve employability of the students as compared to a generic Placement Cell. The CDC at ASU shall act as a platform to drive student and industry engagement in the university. This dedicated cell shall be responsible for implementing the industry engagement strategy along with supporting students in developing a sustainable career in an industry of their choice and fitment. The CDC shall be headed by a Career Development Officer (staff member) and team (the team could comprise of senior students). To achieve its intended objectives, it is suggested that the CDC plans its activities across two main tracks viz. Career Support Services and Industry Engagement and Placement Services. The Career Support Services (CSS) will focus on initiatives that will help the student to choose and develop a career. Whereas, the Industry Engagement and Placement Services will ensure that industry is an essential part of the training value chain at ASU.

Partnerships and Industry Engagement

The proposed industry-institute engagement may aim to be a mix of financial (student sponsorships, industry sponsored labs / COEs, endowments, consultancy) and non-financial (industry Exposure (OJT and Apprenticeships), placement, mentoring, curriculum development, capacity building of trainers, research & knowledge sharing, provide experience people on secondment and international recognition) partnerships. The suggested key measures to build conducive relationship with the industry shall include building synergistic relations with industries by regular visits and surveys, offer infrastructure of the ASU on hired or rental basis to industries and undertake research projects or job work for the Industries where the students can participate.

Given the scale of operations envisaged by ASU, quality needs to be at the center of effective skill development programs at the university. It is recommended that trainees, industry/employers and the general public are assured that the training and qualifications provided through skill development programs at ASU are of a high quality and internationally comparable, regardless of who delivers and assesses it within the campus. Therefore, it is recommended that ASU and its skill development programs can be accredited by professional bodies such as NAAC, NAB, NABET, NCVET, etc.

Partnerships other than with the industries will be key to establishing a robust, contextual and effective skill development and vocational training system at ASU. Some of areas of strategic partnerships include partnership with select SSCs, national and state government, international assessment, certifying and training agencies and other national missions. In addition, partnerships must also aid in preparing the students to qualify and win national and international skills competitions bringing laurels not only to the university but the country as a whole.

Governance and Administration

In addition to the Court, Executive Council, Skill Council, Finance Committee, Faculties/Department as mentioned in the ASU Act, it is suggested that following council/committee be the statutory authorities of the university[3]: Board of Studies, Planning Board, Estate Management Committee and Grievance Redressal Committee. Details regarding the composition and the broad functions of each of the

[3] The university may plan to institutionalize such committees whose powers functions would be defined by the Chancellor/Vice Chancellor/Executive Council as applicable. The manner of appointment and powers and functions shall be such, as may be prescribed by the Statutes.

statutory authorities are briefly outlined in the report. The University shall not be authorized to create any teaching and non-teaching post or even revise the pay scales of the teaching and non-teaching employees without obtaining the prior approval of the State Government. However, the Executive Council of the University can recommend creation or abolition of teaching and non-teaching posts to the State Government. Moreover, ASU will adopt a process of free, fair and transparent recruitment for all staff. All appointments to teaching and non-teaching posts shall be made by the Executive Council on the recommendations of the Selection Committee.

The key officials proposed for ASU include: Chancellor, Vice-Chancellor, Registrar, Controller of Examinations, Controller of Finance, Director – HR, Director – Outreach and Branding, Estate Manager, Dean of Schools, Librarian, Director – Partnership and Alliances, Mobilization and Placement Officer, Gender, Social Inclusion and Environment Safeguards Expert, Head-Legal and Ethics and Student Counselling Officer.

International and National Best Practice Overview

The states of Gujarat, Karnataka and Kerala were shortlisted as advanced states for reviewing their current practices in R&D, innovation, startup and skilling ecosystem considering parameters like economy, demography, ranking on Innovation Index, employability, etc. The states seem to lay immense focus on providing infrastructure facilities like ITI, new buildings, workshop, skilling of women and backward communities and boast of innovative startup policies and significant number of R&D institutions across verticals such as pharmaceuticals, renewable energy, telecom, semiconductor, consumer electronics, etc. and dedicated entrepreneurship development institutes.

IIT Guwahati has a CoE for Sustainable Polymers to conduct research that aims to develop cost effective and scalable technologies for the making of biodegradable polymer-based end products[4]. Further, IIE undertakes research and studies either on its own or on sponsored basis and provides consultancy in the field of growth and development of MSMEs across North East India and other states[5]. Tezpur University[6], Assam Agricultural University[7], IIIT Guwahati[8] and Assam Downtown University[9] have a dedicated R&D centre. Further, the 'Entrepreneurial Development Cell' of IIT Guwahati organizes IITG Entrepreneurial Summit annually[10]. Moreover, like many skilling institutes in the country, Assam based institutions such as IIT Guwahati[11], Tezpur University[12], NIRD[13], IIIT Guwahati[14], Assam Downtown University[15], IHM[16] and IIHT[17] have partnerships with several local and national level employers/industries for students' internships and placements. In addition, Assam Downtown University has a dedicated 'Learning Management System' called PRAN that helps in delivery of learning materials and lectures and conduct assessments virtually[18].

To bring in international perspective and draw learnings relevant to ASU context, Singapore and Israel were considered given that the two countries have earned a name for themselves due to their significant

[4] http://www.iitg.ac.in/coesuspol/
[5] https://msde.gov.in/en/organizations/iie#:~:text=The%20major%20activities%20of%20the%20Institute%20include%3A&text=Research%3A%20The%20Institute%20undertakes%20research,East%20India%20and%20other%20states.
[6] http://www.tezu.ernet.in/rnd/
[7] http://www.aau.ac.in/research/directorates-network
[8] http://iiitg.ac.in/research.php
[9] https://adtu.in/research; Prospectus
[10] https://udgam-iitg.in/#:~:text=UDGAM%20is%20the%20Annual%20Entrepreneurship,we've%20got%20you%20covered.
[11] https://www.iitg.ac.in/
[12] http://www.tezu.ernet.in/
[13] http://nerimnirdastu.org/
[14] http://www.iiitg.ac.in/
[15] https://adtu.in/
[16] https://ihmctanghy.org.in/
[17] https://iihtguwahati.in/
[18] Assam Downtown University Prospectus and based on consultation

investment in human capital, R&D and innovation and building a strong Startup ecosystem. The Singapore government began to invest in R&D in a significant and structured way with the launch of National Technology Plan in 1991 and ever since the R&D budget has witnessed 10-fold increase[19]. The country also has a Research Innovation and Enterprise Council which provides strategic direction for national R&D[20]. In its initial years of building R&D capabilities, Singapore heavily relied on an open talent strategy for hiring scientific leaders across the globe to seed its capabilities and mentor other young local scientists[21]. Singapore is also regarded as a favourable hub for entrepreneurship and over the last decade, it has climbed to occupy 12th position among leading global Startup ecosystems in the world which can primarily be attributed to its robust financial and technical infrastructure, ease of doing business, technology adoption, stable political climate and supportive government policies[22].

The Startup ecosystem of Israel is a result of a collaboration between the state (Israel Innovation Authority), military services, venture capital firms, successful entrepreneurs, educational system, business system, incubators and accelerators[23]. Moreover, Israeli government approved additional budget of 390 million NIS for Israel Innovation Authority to increase government investment in small to medium high-tech companies. The country's thriving start-up industry is complimented by a flourishing venture capital market[24].

In addition, numerous other institutes of international repute were studied to holistically understand their best practices throughout the training lifecycle such as ITE Singapore, National Technical Training Institute (NTTI) Cambodia, ITI Malaysia, Technical University of Berlin (TUB) Germany, Australian Institute of Vocational Training and Education (AIVTE) Australia, Cambridge Regional College (CRC), UK, TAFE Institutions Australia and Manitoba Institute of Trades and Technology (MITT) Canada.

Financial Model

ASU is being developed with state-of-the-art infrastructure and facilities with a goal to accommodate about 10,000 students at steady state. The campus of ASU would be developed to make it a self-sustaining ecosystem which boasts of state of art academic, administrative and residential facilities in addition to opportunities to purse co-curricular and recreational activities. The overall Cost of the Project is envisaged to be approximately INR 9300 million.

The university would have a well-diversified revenue generation strategy. These include Tuition Fees, Hostel and Mess Charges, Interest Income, Endowments, Research and Consultancy Income, Assessment, Certification, Affiliation and Accreditation Fees and income from allowable sub - letting of infrastructure and spaces made available on the campus. The contributors to the internal revenue generation for the university would be the Tuition Fees, Hostel and Mess Charges earned from students. Other revenue streams such as Research and Consultancy could potentially be a significant contributor in the future. The key line items that would comprise the expenses for the skill university are manpower (including teaching, non-teaching and other support staff), expenses towards academic delivery such as teaching learning aids, content development cost, lab consumables, other operating expenditures towards day to day campus upkeep such as electricity, water consumption, hostel and mess related expenses, travel and conveyance, repairs and maintenance, student outreach expenses and other miscellaneous and contingent expenses.

The University may not be able to achieve operational break even in the first 10 years of its existence but adequately demonstrates that the university is committed to its goal of financial self - sustainability and would achieve the same between the 12th and 15th year of its operations. Above all, the University

[19] From Research to Innovation to Enterprise: The Case of Singapore, 2016
[20] https://www.nrf.gov.sg/about-nrf/governance/research-innovation-and-enterprise-council-(riec)
[21] From Research to Innovation to Enterprise: The Case of Singapore, 2016
[22] Spotlight on Singapore's Startup Ecosystem
[23] https://startupjedi.vc/content/startup-ecosystem-israel
[24] https://mfa.gov.il/MFA/InnovativeIsrael/Economy/Pages/Government-approves-additional-government-investment-in-small-to-medium-high-tech-companies-19-August-2020.aspx

would impact overall 1,00,000 beneficiaries (70,000 and 30000 directly and indirectly) in the very first 10 years of its existence.

1. About the Assam Skill University and the skills ecosystem

1.1. Assam at a glance

About the State

Assam being the largest State in the North East in terms of Population is the gateway to the North East India sharing its border with seven states and two neighbouring countries. The State is endowed with abundant natural resources and fertile land with total geographical area of 78,438 sq. km which accounts for 2.4% of India's total geographical area[25]. According to Census data 2011, the State is home to 3.12 crore people accounting for 2.6% of the country's total population. The population density has increased over last decade (340 to 398 per sq. km) which is more than the national average of 382[26]. The State's total population has grown by 17.1% during the decade 2001-2011, as compared to the national rate of 17.7%[27]. For administrative purposes, Assam is divided into 33 districts with 80 sub-divisions, 219 Development Blocks and 2202 Gaon Panchayats[28].

While most of the State population resides in the lush valleys of its two major rivers- Brahmaputra and Barak, the districts of Nagaon, Kamrup Rural and Metropolitan, Barpeta, Dhubri, Sonitpur, Darrang and Cachar account for higher population concentration. Further, major urban centres of Assam include Guwahati, Silchar and Dibrugarh which are earning a name for themselves with Guwahati occupying position among 100 fastest growing cities in the world[29] and Dibrugarh emerging as an important hub for oil and natural gas industries. The State, particularly rural areas are dependent on agriculture for economic growth and livelihood generation owing to its rich water resources, vast tracts of fertile land and agro-climatic conditions suitable for varied agri-based products. In addition, mining is an important driver for propelling the State's GDP due to abundant reserves of petroleum, natural gas, coal, limestone and other minor minerals.

Demography

As per the national census 2011, the State's population is characterized by socio-cultural and ethnic diversity. Of the total 3.12 crore people, 51% are male and 49% are female. Further, **overall literacy rate in the State has increased from 63.3% in 2001 to 72.2% in 2011, which is marginally below the national average of 74%. Thus, the State has seen an upward trend and shrinking gender-gap in literacy rate**. Also, the sex ratio has improved over the last decade and is better than the national average of 943. Assam is largely a **rural economy with ~86% population**

Table 1: Overview of socio-demographic indicators

Indicators	2001	2011
Population (lakhs)	267	312
Rural Population (%)	87.1	85.9
Sex Ratio (females per '000 males)	935	958
Population in the age of 15-34 years (% of total population) (%)	35	36
Literacy Rate (%)	63.3	72.2
Male Literacy Rate (%)	71.3	77.9
Female Literacy Rate (%)	54.6	66.3
Total Workers (as a % of total population) (%)	36	38
Main Workers (as a % of total population) (%)	27	28
Marginal Workers (as a % of total population) (%)	9	11

Source: Census 2011

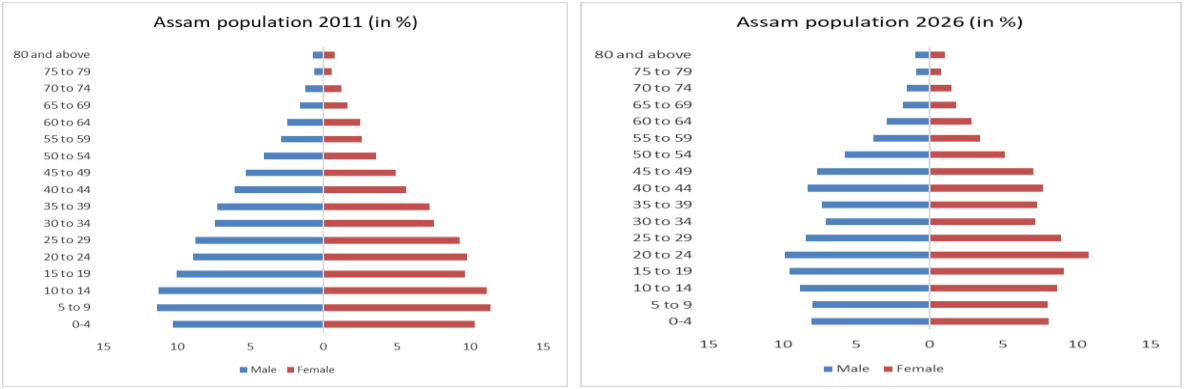
[25] Census data 2011
[26] Census data 2011
[27] Census data 2011
[28] Directorate of Economics and Statistics, Govt. of Assam
[29] The Transition to a Predominantly Urban World and its Underpinnings, 2007: International Institute for Environment and Development

living in rural areas[30]. Districts like Dhubri, Goalpara, Barpeta, Hailakandi, Morigaon, and Nagaon registered growth rates between 20-24% during the last decade. Further, the cities of Guwahati, Nagaon, Dibrugarh and Silchar account for approximately 25%, 2.6%, 3.2% and 3.9% of the total urban population of the State respectively[31]. Of the total population, 38% are in workforce (28% main workers and 11% marginal workers); however, the **gender gap in the workforce participation rate is large with only 22% of women participating in the workforce as compared to 54% of their male counterparts**[32], which is typically characteristic of the Indian labour market. The State has seen considerable economic growth, with the GSDP during 2016-17 (QE[33]) at constant price recording a growth of 6.8% over the previous year[34]. The State has also seen a marginal decline in poverty (from 34.4% living below poverty line in 2004-05 to 32% in 2011-12). However, challenges still exist as the State's poverty rate is more than the national average of 21.9%[35]. **Assam with Human Development Index (HDI) of 0.61 occupied 21st position among all Indian States in in the year 2017**[36].

The window of demographic dividend opportunity in India is projected to last till 2055-56 as per UNFPA's demographic dividend study in India[37]. However, due to varying fertility rates across states, i.e. staggered demographic transition, there are regional variations in terms of demographic dividend window with maturing south and west and young north and east. With a General Fertility Rate[38] (GFR) of 75.2, the State of **Assam lies within the category of States where demographic dividend opportunity will last for another decade or so**.

An analysis of the census 2011 data suggests that, Assam is a young State and nearly 36% of its total population falls in the age group of 15-34 years presenting a favourable demographic structure. Further, the State's population is expected to increase to 40.2 million by the year 2026 with an estimated addition of nearly 4 million people in the age category of 15-34 years (between 2011 and 2026). Thus, the share of youth will increase from 36% in 2011 to 38% in 2026 as summarized in the figures below. Further, it is expected that the number of people in the working age group (15-59 years) will increase from 18.8 million in 2011 to 27.8 million in 2026[39].

Figure 1: Population pyramid (2011 and 2026)



Source: Census 2011

[30] Census data 2011
[31] Micro-Level Skill Gap Study for the State of Assam: ASDM
[32] Census data 2011, Office of the Registrar General, India
[33] QE stands for Quick Estimate
[34] Directorate of Economics and Statistics, Assam, MOSPI, CSO
[35] https://www.prsindia.org/theprsblog/poverty-estimation-india
[36] UNDP, Global Data Lab, SBI Research
[37] An Assessment of Demographic Dividend in India and its Large States' by P. M. Kulkarni, 2017'. A study commissioned by UNFPA
[38] GFR is defined as the number of live births per thousand women in the reproductive age group of15-49 years
[39] Census data 2011

Interestingly, the **State's dependency ratio has decreased to 42% in 2017 which means that economically productive population is increasing**, which is a good sign for the State[40]. Further, 76.89% of the rural households have monthly earnings of less than INR 5,000[41] which demonstrates the under-employability of the working age population and is also a contributor to the lower per capita income in the State.

Ethnic minority and disabled people

Assam abounds in ethnic diversity with different languages, traditions and cultural practices prevailing across the State. The ethnic tribes and races dwelling together in Assam have made the State culturally very rich. The social groups of Assam have recorded uneven progress over time. While there has been a sharp decline in the poverty among scheduled casts post 2005, scheduled tribes and other backward castes have seen a rise in poverty levels. However, all the minority groups across the State face similar poverty levels. While there is very little difference in open defecation conditions, access to drinking water and schooling provisions between the social groups, some of these groups have even lower access to salaried jobs than others[42].

The major tribes of the State include Bodo (35.1%), Mishing (17.5%), Karbi (11.1%), Rabha (7.6%), Sonowal Kachari (6.5%), Lalung (5.2%), Garo (4.2%), and Dimasa tribes (3.2%). They constitute 90% of the ST population of the state. The other tribal people in Assam are Deori, Hajong, Thengal Kachari, Khasi, Jaintia, Mech, Chakma, Mizo, Hmar, Kuki tribes, Naga tribes, Barmans (in Cachar), Man (Tai speaking), Khampti and Singhpho tribes[43].

As per Census 2011, India has about 2.7 crores disabled people, out of which 1.8% are in Assam[44]. Assam has 480,065 people with disabilities of different kinds. Among these 2,57,385 are male and around 2,22,680 are female. However, as the total population of the State has increased, these numbers have also seen an upward rise i.e., from 2.7 crores in 2001 to 3.1 crores in 2011 respectively. The number of people with disabilities has been higher in the rural areas of the State as compared to the urban areas[45].

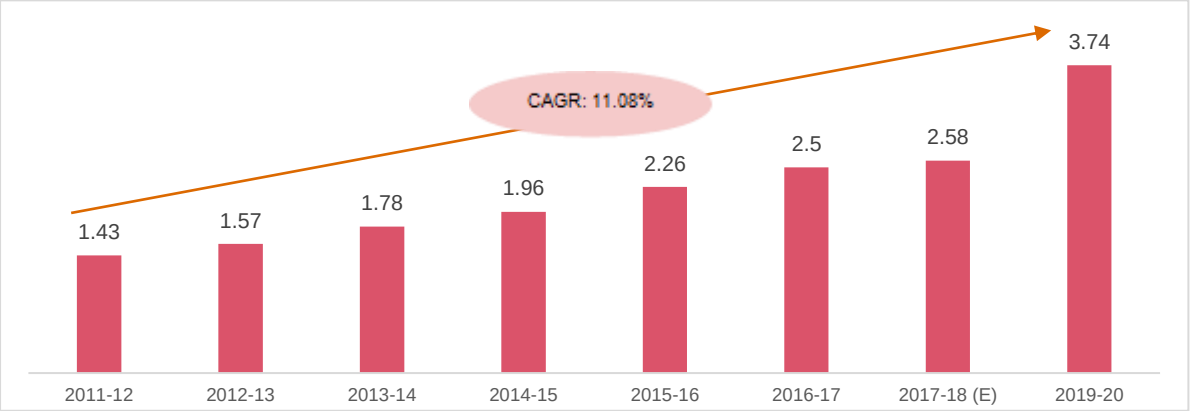
Economy

Assam's economy is considered to be the largest in the North-eastern region of the country due to its relative proximity to the rest of the country and availability of quality infrastructure. The GSDP of the State in FY 2018 is estimated to be INR 288,494 Cr. at current prices growing from INR 254,478 Cr. in FY 2017[46]. **Between 2011-12 and 2019-20, Gross State Domestic Product (GSDP) expanded at a Compound Annual Growth Rate (CAGR) of 11.08% amounting to Rs 3.74 trillion**[47] as shown in the figure below.

The State besides being a tourist destination also boasts of being largest tea growing region in the world accounting for 1/7th of the global tea production and 51% in the country's overall tea production in 2019-20[48]. The continuous rise in the state's GSDP can also be attributed to the industrial and service-based activities picking pace in the State.

[40] Annual PLFS Report 2017-18
[41] Socio-Economic and Caste Census 2011
[42] Assam - Social Inclusion the World Bank Group
[43] Tribal Development Plan Jan 2016: World Bank assisted Citizen Centric Service Delivery Project, ARIAS Society
[44] Cited from Disabled Persons in India a Statistical profile 2016 - MOSPI
[45] Census data 2011
[46] Directorate of Economics and Statistics, Assam, MOSPI, CSO
[47] Directorate of Economics and Statistics, Assam, MOSPI, CSO
[48] https://www.ibef.org/states/assam-presentation

Figure 2: GSDP of Assam at current prices (in INR trillion)

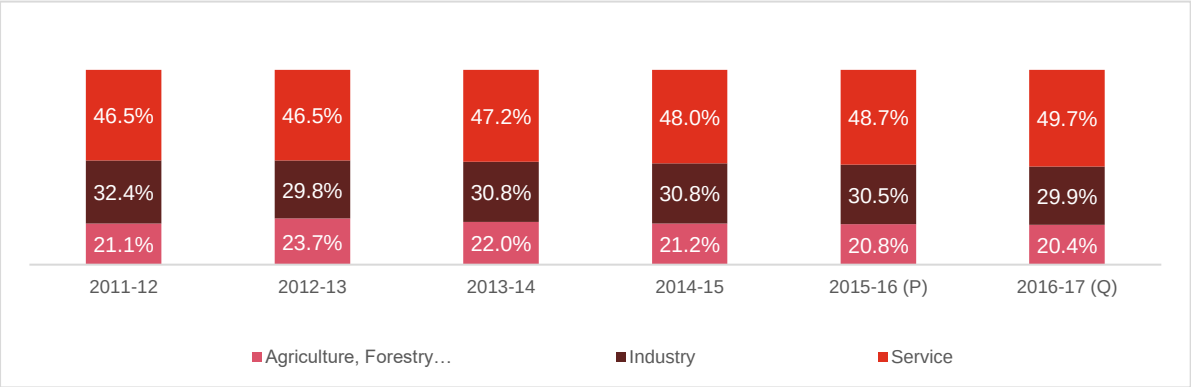


Source: Directorate of Economics and Statistics, Assam, MOSPI, CSO

The districts of Kamrup, Kamrup metropolitan, Nagaon, Jorhat, Sivasagar, Dibrugarh and Charaideo contribute more than 5% to the State's GSDP. Currently, there are **20 industrial estates, 3 industrial growth centres, 11 Integrated Infrastructure Development Depots, 17 industrial areas, 12 growth centres, 8 mini industrial estates, 1 export promotion park and 1 food processing industrial park in Assam**[49]. The government has undertaken several initiatives to make the State a favourable investment destination, some of the initiatives include introduction and adoption of North East Industrial Investment Promotion Policy, setting up of Balipara in the Sonitpur district and Matia in Goalpara, increased fund allocation for wildlife tourism[50], etc. Such initiatives are likely to propel the State's GDP and its contribution to the country's overall economy.

Analysing the sectoral composition of GSDP indicates that the share of service sector has been the highest followed by industry and agriculture and allied sector during 2011-12 to 2016-17 (QE) period. From the figure below it can be noted that a marginal decline in agriculture and allied sector and industry has resulted in increase in service sector. Thus, with a share of nearly half the total GSDP, Assam's economy is largely driven by the service sector with Transport, Storage, Communication & Services related to broadcasting, Trade, Repair, Hotel & Restaurants and Public Administration & Other Services constituting 8.65%, 7.8% and 11.3% respectively among the service sub-sectors[51].

Figure 3: Sectoral composition of GSDP at constant (2011-12) prices



Source: Economic Survey Assam 2017-18

[49] https://www.ibef.org/industry/assam-presentation
[50] https://www.ibef.org/industry/assam-presentation
[51] Economic Survey Assam 2017-18

However, the importance of agriculture and allied sector as a significant contributor to the State economy cannot be undermined as fluctuations in the production of food grains, vegetables and fruits continue to impact the State economy. It is noteworthy that nearly 50% of the districts in Assam contribute less than 3% each to the State GSDP pointing towards regional variations with urban centric/metropolitan areas being major industrial hubs[52]. The table below summarizes the contribution of sub-sectors of agriculture, industry and services sector and it can be noted that among agriculture, crops account for highest share, manufacturing contributes maximum to the industries sector and Trade, Repair, Hotels & Restaurants is a significant contributor of the service sector.

Table 2: Sub-sector wise contribution to the broad industries (2016-17) at constant 2011-12 prices

S.No.	Industry	% share to the industry
1.	**Agriculture, Forestry and Fishing**	
1.1	Crops	75%
1.2	Livestock	5%
1.3	Forestry & Logging	6%
1.4	Fishing and aquaculture	14%
2	**Industry Sector**	
2.1	Mining & Quarrying	24%
2.2	Manufacturing	38%
2.3	Electricity, Gas, Water Supply and other utility services	6%
2.4	Construction	32%
3	**Services**	
3.1	Trade, Repair, Hotels & Restaurants	33%
3.2	Transport, Storage, Communication and services related to broadcasting	14%
3.3	Financial Services	6%
3.4	Real Estate, Ownership of dwelling & Professional Services	13%
3.5	Public Administration	15%
3.6	Other Services	19%

Source: Economic Survey of Assam 2017-18

In addition, MSME sector plays a critical role towards generating formal employment in the State. There were a total of 47,048 MSME units present in Assam in 2017-18, employing about 2.8 lakh people[53]. The table below presents a summary of policy and financial impetus expected across some of the sectors of economic importance for the State of Assam:

[52] Economic Survey of Assam 2017-18
[53] Ministry of MSMEs, Govt. of India

Table 3: Sector wise investments and key policies

Priority sectors	Expected investment, key policy impetus
IT & ITES (including design and media)	• IT parks in Guwahati, Dibrugarh and Silchar with approximate project cost of projects INR 1740 crore • Setting up of at least 15 BPOs across the State in the rural areas and the project costs INR 635 crores • Proposed Assam State Data centre for INR 232.4 crores • Development of Film City at Assam worth INR 500 crore
Agriculture & Allied Activities	• Several Parks namely Banana Park at Matia, Orchid Park at Guwahati at Aqua park at Hajo
Bamboo and Tea	• Tea Park at Jorhat worth INR 123 Crore • Bamboo Technology Park with Bamboo Furniture Production Unit at Chaygaon, Kamrup
Food Processing	• 58.41 acre North East Mega Food Park at Nalbari
Forestry, logging, animal husbandry, and fishing	• Milk processing plants at Silchar, Tezpur, Nagaon and Bajali • Organic fodder production and Organic Milk Production in districts of Assam • Aqua Park at Hajo • Setting up of Veterinary Biologicals Products (Vaccines) and Feed Mill Plant at Dibrugarh
Engineering (Mechatronics, Electronics and Automation)	• Electronics Manufacturing Cluster, Guwahati worth INR 290 crore
Transportation Management including Vertical Transportation and Logistics (International Logistics), Civil Aviation, Water and ports	• Inland water transport in Karimganj, Nimati Ghat and Silhat worth 515 crores
Manufacturing- textiles, wooden products, traditional crafts	• Manufacturing of Bamboo Mat Board, Bamboo Mat Corrugated Sheets & Bamboo Floorboard of worth 8.21 crore • Cane & Bamboo based Handicrafts Production Unit at Guwahati worth .5 crore
Tourism & Hospitality including Wellness	• Development of Golf Resort / Hotel at Chandrapur, Kamrup (M) worth INR 330 crore • Development of Resort at Chandubi, Kamrup and several luxury lodges
Healthcare and Nursing	• Establishment and operations of Nursing Colleges with 60 seats each in 10 Districts of Assam • Establishment of New Medical College attached with existing District Hospital in Goalpara District (Area of project 30 Acre) • AYUSH Training Institute cum Wellness Centre in Nabagraha Hills, Guwahati approximate cost of project 10 crore
Construction	• Multi-Sector industrial parks at Bongaigaon, Tinsukia, Nagaon, Sadiya, Goalpara, Kamrup, Karimganj, Bijni, Guwahati, and Jagiroad with approximate project cost of INR 462 cr

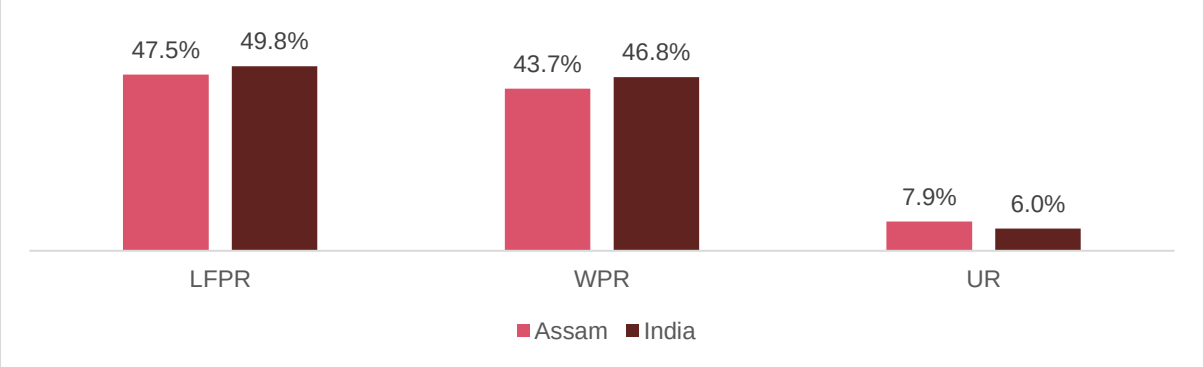
Priority sectors	Expected investment, key policy impetus
Plastic and Petrochemical, Natural Gas,	• Plastic Park at Gelapukuri, Tinsukia in 173 acres with project cost INR 250 cr • Chemical Hub, Chandrapur in 51 acre and cost of project is INR 76 cr
Other Sectors- Power and Hydro (Arunachal, Nagaland, Manipur)	• 20 MW Solar Power Generation units proposed at CSM Campus, Goalpara, Tezpur and Nagaon with total cost of project INR 515 cr • Micro Solar Power Projects, 10 major cities of Assam and cost of project INR 30 crores • Sonapur Sub-Station with approximate cost of INR 370 cr
Language and Employability	• Management college at Jorhat and Matia • Engineering college at Dibrugarh, Bongaigaon, Nalbari, and Matia • Polytechnic Institutions at Tezpur, Lakhimpur, Kokrajhar and Dima Haso

Source: Advantage Assam (https://advantageassam.com/investible-projects)

Labour demand and supply

The labour force participation rate – an indicator of labour supply – is marginally lower in Assam compared to the national average. As per Annual PLFS Report 2017-18, LFPR in Assam is 47.5% compared to the national average of 49.8%. A similar trend exists in rural and urban areas. The unemployment rate – an indicator of lack of labour demand – is higher in Assam compared to the national average. The UR in Assam is 7.9% compared to the national average of 6%. The differential is even higher for females. The female unemployment rate in Assam is 13.6% which is about twice the UR at national level (5.6%)[54].

Figure 4: LFPR, WPR and UR (2017)

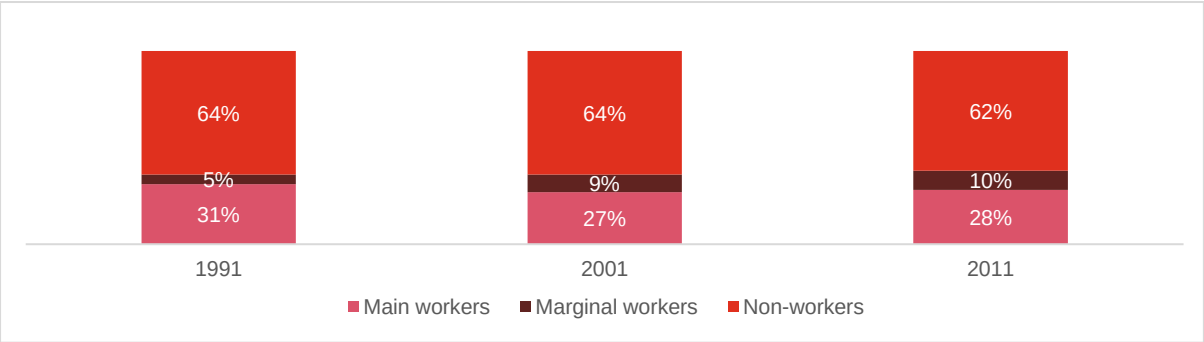


Source: Annual PLFS Report 2017-18

The figure below shows the trend of Main workers, Marginal workers and Non-workers in Assam as per the last three national censuses (1991, 2001 and 2011). It can be noted that proportion of marginal workers shows an increasing trend and the proportion of non-workers although remained more or less at the same level in 1991 and 2001, it showed a slight decline in 2011.

[54] Annual PLFS Report 2017-18

Figure 5: Composition of workforce in Assam



Source: Census data

While, the State has progressed across various socio-demographic and economic indicators, vulnerability to climate change, being frequently hit by floods results in loss of lives, livelihoods and property. Agriculture sector providing livelihood opportunities to 70% of the State population[55], is the most affected one due to these floods.

1.2. Skill development scenario

Owing to India's demographic dividend advantage, the country has the potential to occupy a distinctive place in the world by becoming the largest reservoir of manpower supply that underlines the need to develop and empower the nation's human capital. In addition, as per NSDC's skill gap report 2012 conducted throughout India, there will be an incremental human resource requirement of 109.7 million by 2022 with sectors such as Building Construction & Real Estate, Logistics, Retail, Beauty and Wellness, Textile & Apparel accounting for maximum share. However, as per India Skills Report 2020, only 46% of the total students applying for jobs in the market have the appropriate skills as per employer requirements.

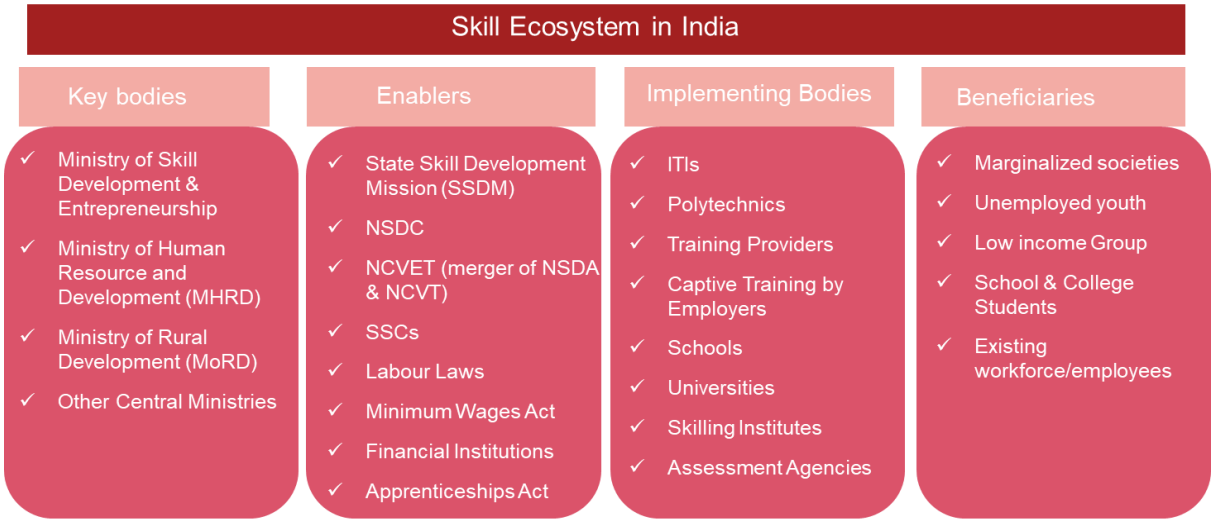
Further, in light of the government's initiatives such as Make in India, Digital India, Smart Cities Mission, etc., technological advancements (i.e. industry 4.0 technologies) and the recent focus on 'AtmaNirbhar Bharat' in light of COVID- 19 pandemic, fresh employment opportunities are getting created in the field of engineering, manufacturing, construction, retail, etc. In order to assess the labour market dynamics, leverage on its demographic dividend advantage and become global reservoir of manpower supply, the government is leaving no stone unturned to make India the future skills capital of the world. The strong push for talent development has resulted in a comprehensive skills ecosystem in the country under the Skill India program, along with various policy initiatives to speed up the skilling process.

1.2.1. Overview of the skilling ecosystem in India

To inculcate and advance skills level among the working age population, the government has developed a skills development ecosystem in a way that ensures larger participation from various stakeholders which includes decision making bodies, enablers, implementing agencies and target beneficiaries. The exhibit below gives an overview of the current skilling landscape in the country.

[55] Directorate of Economics and Statistics, Govt. of Assam

Figure 6: Overview of skill ecosystem in India



Source: MSDE, NSDC, MHRD websites

As a part of the 12th five-year plan, the Indian government formulated the National Policy on Skill Development (NPSD) in 2009 with the objective to train 500 million people in vocational skills by 2022 through various ministries and national bodies so as to create an empowered, skilled workforce with internationally recognized qualification[56]. In line with the policy, National Skill Development Corporation (NSDC)- a Public Private Partnership (PPP) initiative was also established to further expand the vocational education network, to foster private sector initiatives in skills development and reduce the existing skill gap in the country. Subsequently, in order to institutionalize industry-led training, Sector Skill Councils (SSCs) were established which were incubated and supported by NSDC. Currently, the NSDC Board has approved 38 SSCs operating either as an autonomous body, Section 8 Company, or a Society[57].

In 2013, the Indian government constituted National Skill Development Agency (NSDA) for the purpose of coordinating and harmonizing the skill development efforts of the centre and the private sector. Recognizing the significance of a unified qualifications framework, Government of India launched the National Skills Qualification Framework (NSQF) in the same year to minimize duplicity and bring synergies between academic and vocational education systems which have been operating in silos. The framework is based on competency modelling with levels ranging from 1 to 10 defining knowledge, skills and aptitude needed at each level[58].

However, with multiple skilling agencies/bodies at play, the government created a separate Ministry of Skill Development and Entrepreneurship (MSDE) in 2014 to give coherence to skill training efforts in the country with the objective of enhancing employability of the nation's youth. MSDE (earlier Department of Skill Development and Entrepreneurship, first created in July 2014) is also driving the 'Skill India' agenda in a 'Mission Mode' in order to converge existing skill training initiatives and combine scale and quality of skilling efforts, with speed. States have been encouraged to create State Skill Development Missions (SSDM) along the lines of National Skill Development Mission with a Steering Committee and Mission Directorate at State level. Till date, SSDMs have been constituted in nearly 20 States of the country[59]. In addition, National Council for Vocational Training (NCVT)- a tripartite body

[56] http://oldtm.lbp.world/SeminarPdf/165.pdf
[57] https://nsdcindia.org/sector-skill-councils#:~:text=Hospitality%20Skill%20Council-,Connect%20with%20Sector%20Skill%20Councils,Governing%20Councils%20of%20these%20SSCs.
[58] https://www.nsda.gov.in/nsqf.html
[59] http://ddugky.gov.in/content/state-skill-development-missions

initially formed in the year 1956 has been transferred to MSDE and has been partially modified and re-constituted. It is entrusted with advising on overall policy/programs, specifying necessary standards and curriculum for craftsmen training and conducting All-India Tests and awarding candidates with National Trade Certificates[60]. Another critical institution of MSDE is the Regional Directorates of Apprenticeship Training (RDATs) who are endowed with the responsibility of monitoring the implementation of the Apprenticeship Act for trade apprentices in Central government undertakings/departments.

Further, the country recognized the need for promoting the culture of entrepreneurship and addressing the challenge of skilling at scale with speed and quality and hence introduced National Policy on Skill Development and Entrepreneurship, 2015. This policy takes a comprehensive, fresh look at the already existing NPSD 2009 and endorses the need for full ecosystem to unlock entrepreneurial potential especially among women, under-represented groups and foster grassroot innovations[61]. In addition, MHRD launched the National Innovation and Startup Policy 2019 for students and faculty of higher education institutions to proactively engage students, faculties and staff in innovation and entrepreneurship related activities[62].

To further re-energise the country's workforce and youth, Skills India Mission was launched in 2015 and this has ushered India in the new era. In addition, as per MSDE notification dated 5th Dec 2018, the existing skill regulatory bodies- NSDA and NCVT have been subsumed into National Council for Vocational Education and Training (NCVET) which will act as an overarching skills regulator[63].

Currently, formal skills training is being imparted in the country through a network of ITIs, polytechnics, training service providers, skilling universities and institutes, Centres of Excellence (CoE), some higher education institutions and schools. These in brief are:

Skilling initiatives

Figure 7: Skilling initiatives

Initiatives under the Skills India Mission such as Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Pradhan Mantri Kaushal Kendras, (PMKK) Deen Dayal Updadhyaya Grameen Kaushalya Yojana (DDU-GKY), Recognition of Prior Learning (RPL), Skill Loan Scheme, amendments in the Apprentices Act, 1961 where more regulatory rights have now been given to the industry are some examples of Government's move towards making the country world skills capital. Further, to build a sustainable model of skilling with increased industry participation, MSDE introduced a scheme called National Apprenticeship Promotion Scheme (NAPS) in 2016 to promote apprenticeship training and to increase the engagement of apprentices. The two external aided programs, Skill Strengthening for Industrial Value Enhancement (STRIVE)[64] and Skill Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP)[65] are expected to strengthen the short term and long-term skilling ecosystem. Some of the other skilling projects undertaken by NSDC include Yuva[66], Udaan[67], etc. The government is undertaking several measures aimed at promoting entrepreneurship such as MSDE's Economic Empowerment of Women Entrepreneurs and Start-ups

60

NCVT MIS Homehttps://www.ncvtmis.gov.in

61 https://msde.gov.in/index.php/en/reports-documents/policies/national-policy-skill-development-and-entrepreneurship-2015

62 https://mic.gov.in/assets/doc/startup_policy_2019.pdf

63 https://www.nsda.gov.in/NCVET/nsda-about-us.html

64 It has been introduced with the objective of improving the relevance and efficiency of skills training provided through ITIs and apprenticeships

65 It aims at enhancing the employability potential of the youth to the greatest extent possible

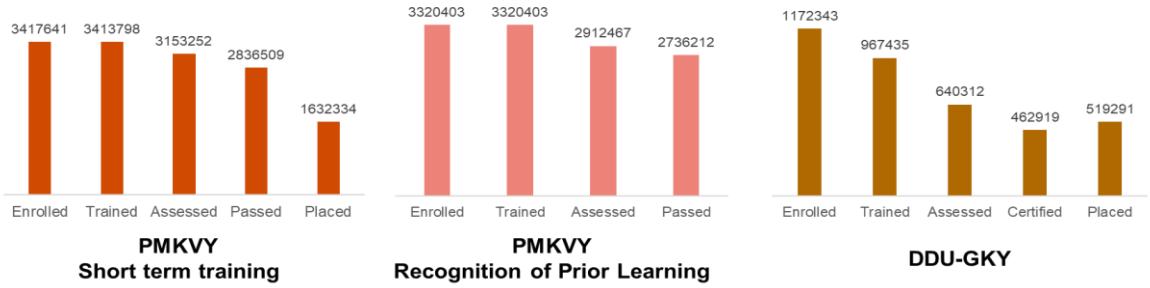
66 Skilling school dropouts and those addicted to drugs or involved in petty crimes

67 Provide skill and job opportunities to youth of Jammu & Kashmir who are graduate, post graduate and 3 year diploma engineers

by Women project, MoMSME's Prime Minister's Employment Generation Programme, NITI Aayog's flagship initiative 'Atal Innovation Mission' and MoRD's Rural Self Employment and Training Institutes[68].

Some of the comprehensive skill development interventions (other than the mainstream vocational education interventions) being implemented by Government of India, include: (a) PMKVY; (b) PMKK; (c) DDU-GKY and others. Thus, on the short-term skilling front, MSDE through NSDC and various SSCs is imparting NSQF aligned training under PMKVY, DDU-GKY and RPL. The achievements of the two flagship schemes of the centre as on 1st Jan 2020 are represented in the graphs below:

Figure 8: Status of short-term trainings under various schemes



Source: PMKVY and DDU-GKY dashboard

It can be noted that Short-term trainings, RPL and Special Projects under PMKVY 2.0 (2016-20) have successfully trained over 68 lakh candidates. However, despite increasing allocations devoted towards this flagship scheme, the program is still far from achieving its intended target to skill 1 crore youth from 2016-20. As on 1 Jan 2021, there are a total of 32,253 PMKVY training centres registered across India (RPL – 22,550, STT – 8,804, Special projects – 899). These training centres are operated by around 2,722 (RPL – 141, STT – 2,509, Special projects – 72) authorized training partners of PMKVY[69]. **The informal channel of skill acquisition is more unstructured and can be imparted through working on the job or through experiential or hereditary learning.**

In addition, with many of the present jobs and skill sets becoming redundant and new jobs requiring new skills, NSDC has signed an MoU with IBM Skills Academy to cater to the demand of skilled workforce for emerging job roles in the future[70]. NSDC has also partnered with Singapore e-Government Leadership Centre (eGL) at the National University of Singapore's Institute of Systems Science (NUS-ISS) for vocational training on emerging technology areas like Data Analytics, Artificial Intelligence and Robotics[71]. Also, to ensure continuous and remote learning during COVID-19 pandemic, NSDC launched the e-skills India platform offering a wide array of online courses for free[72].

Skill universities and higher education institutions

The National Skills and Entrepreneurship Policy 2015 envisaged skill universities and institutes to be promoted and established in close collaboration with States as centres of excellence for skill development and training of trainers. As per MSDE, the universities are to be established with the clear objective of promoting skills education in an integrated manner with general education to ensure pathways for progression and mobility across forms of education and skills. A draft bill was presented in the cabinet in 2015 on the establishment of national skill universities. Further, MSDE in the year 2018 formulated guidelines in consultation with multiple stakeholders regarding the formation of skill universities in the country. The guidelines throw light on the establishment model of the university (such

[68] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1658320
[69] PMKVY Dashboard last accessed in Jan 2021
[70] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1545012
[71] https://www.nationalskillsnetwork.in/singapore-nus-nsdc-mou/
[72] https://eskillindia.org/

as Public University or a Private University or in Public Private Partnership (PPP) mode). Additionally, UGC introduced B.Voc courses in higher education institutions mapping the curriculum with the job role descriptions as per NSQF and currently, B.Voc course has been approved for 127 Universities/Colleges across the country[73].

Centers of Excellence (CoE)

CoE is a network of institutions/individuals/entities collaborating with each other to be one stop resource centre established/working in partnership with industry to raise training standards, boost productivity, address emerging skill gaps and align training research with industry needs. Some of the renowned CoEs established in the vicinity of skilling institutes include TPSDI's 2 CoEs- The Centre of Excellence for Power System skills and another in Trombay which is the Centre for Excellence for power plant skills. Also, Symbiosis Skills and Professional University has set up 3 CoEs for road safety, retail and beauty and wellness in collaboration with various industry partners[74].

Industrial Training Institutes (ITIs)

India has a total of 14,777 ITIs offering 106 trades with a total training capacity of 2.3 million candidates having seat utilization of 82.4%. Out of the total capacity of ITIs, 36% is utilized by the Government while the remaining 64% is utilized by the private ITIs[75]. The table below illustrates the details of ITIs.

Table 4: Details of ITIs

Type of ITI	Number of ITI	Trades Offered	Total Seats (in lakh)	Utilization (in %)	Top trades based on enrolment capacity
Government	3,062	93	8.69	75.7	Photographer, Cutting & Sewing, Horticulture, Mechanic Auto Electrical and Electronics, Hair & Skin Care, Attendant Operator (Chemical Plant), Electrician, Instrument Mechanic
Private	11,715	70	15.2	86.8	Electrician, Welder (GMAW & GTAW), Marine Fitter, Fitter, Machinist, Solar Technician, Stenographer & Secretarial Assistant

Source: NCVT MIS last accessed in Feb 2021

Polytechnics

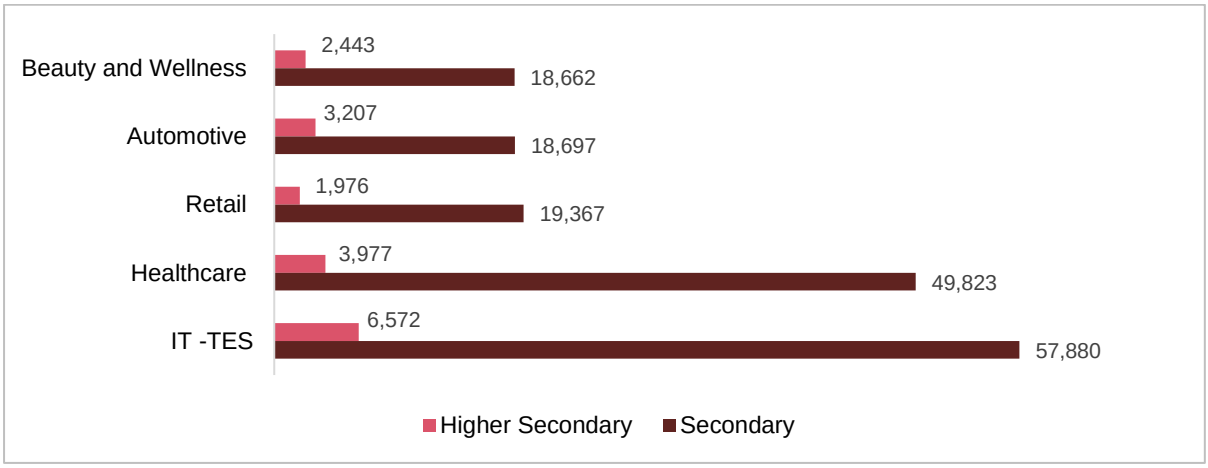
Polytechnic institutes are established to impart training in both engineering and non-engineering trades. As per AISHE report 2018-19, India had a total of 3,440 Polytechnics with 15.13 lakh students enrolled and out of them 81.76% were male students suggesting lower participation by female candidates. The report further stated that there were 9 States which together accounted for 82% of the total enrolled candidates, namely Tamil Nadu, Maharashtra, Uttar Pradesh, Karnataka, Odisha, West Bengal, Andhra Pradesh, Telangana and Punjab. While majority of the training is being conducted in engineering trades a few institutes also offer training in non-engineering trades. Some of the trades amongst which trainings are imparted include Mechanical Engineering (tool and die), Civil Engineering, Electronics and communication engineering, IT, Library and information sciences, Food Technology, Medical Lab Technology, etc[76].

[73] https://www.mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/List-BVoc-Colleges-and-Universities-India.pdf
[74] https://www.tpsdi.com/; http://www.ssou.ac.in/
[75] NCVT MIS last accessed in Feb 2021
[76] Assam Directorate of Technical Education

Skill development in schools

To reduce drop-out rates, increase enrolments and equip young people with employable skills, centrally sponsored scheme of vocationalisation at school level- the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) under the Umbrella of Ministry of Human Resource and Development (MHRD) was introduced. It provides for diversification of educational opportunities to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provides an alternative for those pursuing higher education. In 2016-17, 4,084 schools imparted vocational education with an enrolment of 266,746 (243,614 students at the secondary level and 23,132 students at the higher secondary level) across 18 sectors[77].

Figure 9: Top 5 vocational streams in secondary and higher secondary in terms of enrolment (2016-17)



Source: U-DISE 2016-17

It can be noted from the figure above that in the year 2016-17, larger number of students were enrolled in vocation streams at the secondary level as compared to higher secondary level.

Challenges with the existing skill ecosystem in India

Despite the concerted efforts of the government to bridge the demand-supply gap of skilled manpower and ensuring advanced skill levels among the working age population, some key challenges remain to be addressed.

Key challenges
• ***Limited training capacity and inadequate scale:*** The current efforts are not sufficient to adequately respond to the larger skilling mandate of the Government of India, and this requires a new-approach to skilling, through optimization of investments and leveraging existing state-of-the art operational facilities and expert resources/ industry practitioners.
• ***Lack of skills premium:*** After undergoing thorough skills training, trainees obviously expect to earn a premium wage for their skills, however, employers seem averse to paying such a premium for trainees coming from VET institutes/universities.

[77] U-DISE 2016-17

- ***Mismatch between demand supply:*** 5-7 million youth are expected to enter the job market each year with only 2% undergoing vocational training, therefore, there is a massive gap between demand and supply.

- ***Inadequate industry interface:*** Sharda Prasad Committee report, recently released by MSDE, identified "inadequate industry interface" as one of the major issues facing the vocational training system in India. Further, low involvement of industry in delivery, OJT, management of institutions and curriculum design leads to mismatch between skills imparted and those required by industry impacting the relevance of training. Therefore, a new path needs to be outlined that will more effectively engage industry in the design and delivery of vocational training across the country.

- ***Shortage of quality trainers:*** While 3.5 million training personnel graduates from public institutions every year, their quality is questionable. There is also lack of focus on professional development of trainers with no clear career path defined. Therefore, ramping up the quality of trainers through regular ToTs and facilitated interactions with the industry and new technologies will be critical.

- ***Need for pragmatic implementation of a Comprehensive Quality Assurance Framework assuring ONE-Quality and due Industry acknowledgement:*** Skilling in India currently happens in a dispersed manner, while, the NSQF, QPs and NQF are solution, their outreach is limited. Therefore, ramping up efforts to ensure greater adoption of these by training partners and the industry is critical to demonstrate ONE-Quality across the nation

- ***Need for a robust approach for capturing market intelligence and monitoring:*** Data is critical for ensuring quality and that the skilling interventions are in alignment with industry needs. Therefore, there is need of a consolidated monitoring framework, market intelligence and labour market approach.

- ***Lack of an integrated education and skilling approach:*** The education (school and higher) and the skilling ecosystem in India tend to exist in silos. While, efforts such as B.Voc are welcome, their adoption is currently low. Therefore, alignment of these two systems is critical to ensure that trained manpower in this country have the requisite qualifications and possess employable skills.

- ***Need for making skilling aspiring to the youth:*** Skilling is often viewed as the last resort meant for those who have not been successful in formal academic system. Further, low salaries at entry level, lack of employers' endorsements makes it undesirable. This presents the need for conscious endeavour to integrate and duly incorporate 'employability skills' and/or '21st Century employability skills' into the core vocational skilling interventions. In addition, the skilling courses shortlisted and designed are not as per youth aspirations resulting in low uptake.

- ***Skill-Gap between Informal and Formal sector:*** Vocational training for the 95% of the population in the formal sector remains abysmally low. Therefore, facilitating this transition is a need of the hour to ensure adequate manpower for the growing needs of the formal sector.

- ***Challenge of Reskilling:*** Considering the impact of mega trends on businesses, job roles are bound to evolve thus posing the challenge of reskilling at scale. These interventions need support by the government as a safety net for those with jobs at risk of redundancy.

Source: *Emerging Trends in Indian Tourism and Hospitality: Transformation and Innovation; Labour Bureau and World Bank estimates; NSSO, 2011-12 (68th round) report on Status of Education and Vocational Training in India*

In the context of the abovementioned challenges, it is important to have skill development institutes/training centers that would ensure larger participation from various stakeholders, inculcate basic and advanced skill levels among the youth and achieve the aim of the Skills India Policy—namely skilling with speed, scale and quality and making the workforce ready for future technologies.

1.2.2. Overview of the skilling ecosystem in Assam

The state of Assam accounting for 2.6% of the country's population and with nearly 36% of its total population in the age group of 15-34 years[78] has the potential to become one of the biggest contributors of the skilled workforce in the country if skill gaps are adequately addressed.

Traditional higher Education

Assam as a State has made significant progress in providing quality education to students after 12th.class. Every year more than 2 lakh students pass 12th standards including both State and Central board and are ready for pursuing further education[79]. However, the gross enrolment ratio in higher education in Assam is lower than the national average for both the genders, 19.1 for male compared to 26.3 nationally and 18.3 for female compared to 26.4 nationally[80]. According to All India Survey on Higher Education (AISHE) survey report of 2018-19, following are the key highlights for the State[81]:

- **Universities**: 22 universities within the State- 2 central universities, 3 institutes of national importance (Indian Institute of Technology, Guwahati, National Institute of Technology, Silchar, Indian Institute of Information Technology, Guwahati), 10 State public universities, 1 State open university, and 6 State private universities.
- **College and Stand-alone institutions:** 544 colleges and 78 standalone institutions providing higher education to the youth of Assam
- **Number of Colleges per lakh population:** Assam has only 15 colleges per lakh population which is nearly half of the national average of 28 colleges per lakh population
- Out of total number of colleges, 84% are government colleges and 16% are private colleges (both aided and unaided). 94% of college going youth is enrolled in government colleges
- Universities and colleges in Assam have higher pupil to teacher ratio in higher education as compared to national average (31: 1 in the state compared to 29:1 nationally)

Vocational Education and training

The State's Skill Gap Report 2020 has projected that there will be an incremental human resource demand for 12.5 lakh people for the period of 2020-25. Disaggregating total incremental manpower requirement by sector indicates that maximum incremental demand exists in tertiary sector (6.5 lakh) followed by primary (3.7 lakh) and secondary (2.3 lakh) sectors respectively[82]. Thus, it can be inferred that there is a need for imparting skills training on the job roles that exist in the sectors as highlighted in the skill gap report on a priority basis and address the skill gaps as outlined in the State's skill gap report 2020.

Further, the State has vibrant industrial base spanning from generation-old tea industry to oil production, significant presence of banks and financial institutions, textiles, cement, petrochemicals, power, healthcare, etc. The State's Department of Industries and Commerce has identified numerous thrust areas for investment[83] which are delved briefly below:

[78] Census data 2011
[79] Assam Higher Secondary Education Council (AHSEC) results 2020
[80] AISHE Report 2018-19
[81] AISHE Report 2018-19
[82] Assam Skill Gap Report 2020
83 Department of Industries and Commerce, Govt. of Assam (https://industries.assam.gov.in/portlets/thrust-areas-and-potential-sectors)

- ***Food processing and Agro based industries***: Owing to the State's favourable agro-climatic conditions, Assam boasts of a rich variety of fruits, vegetables, spices such as pineapple, orange, turmeric, chilies, etc. Until recently, horticulture was practiced as a non-commercial activity but nowadays agriculture and horticultural produces are being cultivated in the state using mechanized and scientific methods. With the increasing demand for processed food worldwide, the sector has enormous potential to grow at a rapid pace provided adequate research support and better know-how is facilitated.

- ***Mineral based and downstream industries***: Assam is rich in a variety of minerals playing a critical and catalytic role in the overall development of the State and country's economy. Being one of the key sectors of the economy (considered as the backbone of all other sectors), it is endowed with over 1.3 billion tonnes of crude oil reserves, 156 billion cu. mtrs. of natural gas reserves, 700 million tonnes of limestone reserves, over 320 million tonnes of coal reserves and some minor minerals such as china clay, granite, etc[84]. This makes the State an ideal destination for energy/ oil and gas-based industries, thermal power plants and also presents new avenues for several downstream industries such as petro, plastic and allied products.

- ***IT/ ITeS related activities***: According to the State skill gap report 2020 and 2012, Assam's youth has high aspiration to be engaged in this sector. There are numerous opportunities that exist for IT enabled services such as software development, call centres, back office operations, data entry operators, transcription and translation, content development, animation, engineering and design, market research, consultancy and management with districts of Jorhat, Kamprup and Kamrup (M) being the focus. The State has the potential to emerge as a prominent IT Hub in the country after cities like Bengaluru, Hyderabad, Pune, Mumbai and Gurugram and is likely to enjoy same advantages as other prominent IT hubs in India.

- ***Hospitality and Tourism industry***: The State's landscape, lush green forests, wildlife sanctuaries, pilgrimage spots and tea gardens offer a wide choice to nature lovers, wildlife enthusiasts, sightseers and photographers across the world. This sector is regarded not just a growth engine but also an employment generator from the most specialized to unskilled workforce. The state government has been extensively using electronic and print media publicity and marketing campaign so as to unveil Assam to national and foreign tourists.

- *The other sectors of economic prominence as highlighted in the State's Economic Survey 2017-18 include* ***tea and rubber plantation, handloom and sericulture, healthcare, construction and power****.*

These focus sectors for investment will create demand for skilled manpower in the near future stressing the need for skill-based interventions (such as upskilling, fresh skilling, RPL certifications, reskilling). Thus, to achieve the future incremental demand of skilled manpower for the thrust areas, the State govt. is leaving no stone unturned towards building a skilled workforce. For vocational training, the State currently has 36 ITIs (4,656 students enrolled) and 23 polytechnics (7,397 students enrolled) offering trades across various engineering and non-engineering trades. Out of 36 ITIs, 30 are government and 6 are private ITIs offering 24 trades. However, the seat utilization is only 60% in these ITIs[85].

Out of around 2 lakh students passing 12th standard every year from the State, there are only around 35,000 seats available across streams- engineering, arts, science, medical, commerce and vocational education to cater the youth's requirement for higher education[86]. There is a considerable gap in the supply and availability of youth who can pursue skill training to become employable.

From a skill development point of view, it is important to note that in Assam, only 3.1% of the population aged 15 years and above are reported to have received vocational training, out of which, 2.2% acquired

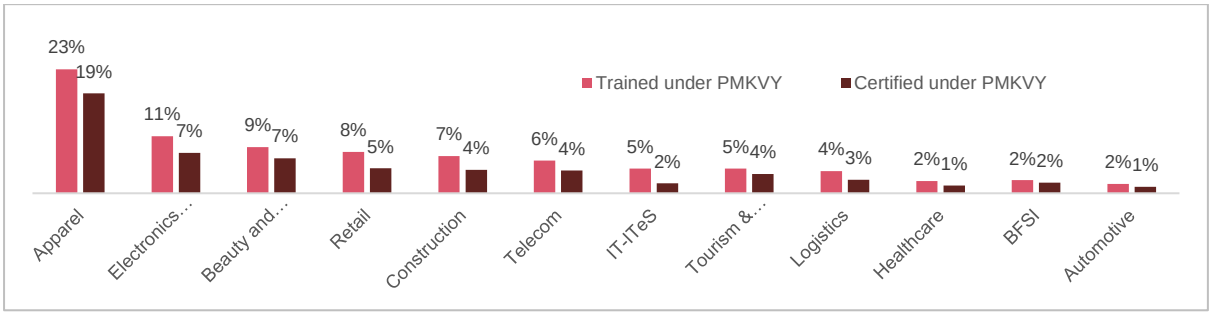
[84] https://industries.assam.gov.in/portlets/thrust-areas-and-potential-sectors
[85] NCVT MIS last accessed in Feb 2021, AISHE Report 2018-19
[86] Study team's analysis

vocational training through formal system and 1% through informal system[87]. Apart from the formal channel for vocational education, Assam government has also constituted the '**Assam Skill Development Mission'** in the year 2017 to address the challenge of unemployment and deliver quality skill training. The State is also supporting national level Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and Deen Dayal Upadhyay Gramin Kaushal Yojana for providing short term skilling opportunity to the youth.

Following are the key highlights of short-term skilling initiatives:

- 136 training partners operating 165 centres in the State and providing training in 26 sectors[88]
- A total of 77,374 candidates have been trained and 58,908 have been certified under the central scheme[89].
- The average placement under the scheme is less than 51% for the certified candidates, which is lower than the national average of 57% as reported by NSDC[90].
- Under DDU-GKY, a total of 97 PIAs are operating in the State and have trained and placed 50,386 and 27,456 candidates respectively. The placement percentage under DDU-GKY scheme is slightly higher **than the PMKVY with 54% compared to less than 51% under PMKVY**[91].

Figure 10: Sector wise training and certification under PMKVY



Source: PMKVY dashboard (https://pmkvyofficial.org/Dashboard.aspx) last accessed in Feb 2021

Apart from the national schemes, the department has also undertaken several skilling initiatives such as **establishment of 9 multi skill education centre (Centre of Excellence) across 9 locations in the State, signed agreement with Sector Skill Councils of NSDC, adopted new candidate mobilization policy, setup skill training center for disabled,** etc. ASDM has also signed an MoU with ITE, Singapore to establish **North East Skill Centre in Guwahati** with focus on trades such as Beauty & Wellness, Retail services, Hospitality operations and Food & Beverage services with the objective of replicating ITE, Singapore skilling model in the State. Advance Skill Training Institutes (ASTI) envisaged as sector specific centres of skill training are also in pipeline to be established across 11 sectors in 11 districts of the State[92].

Further, to provide avenues for self-employment for unemployed youths, farmers, weavers, artisans, entrepreneurs, etc. the State Institute of Rural Development (SIRD), Assam has been organizing training programmes for income generation and livelihood promotion[93]. **Some of key notable institutes in the State which are providing skill training are listed below:**

[87] MoLE Report on Education and Skilling 2015-16
[88] PMKVY 2016-20 data available on NSDC website on 20 July 2020
[89] PMKVY dashboard last accessed in Feb 2021
[90] PMKVY dashboard last accessed in Feb 2021
[91] https://kaushalpragati.nic.in/login/landingReport.do?methodName=show&reqtrack=LJi4jMMVfP0Pk3ADVFH17nL6O#
[92] ASDM (https://asdm.assam.gov.in/frontimpotentdata/skill-initiatives-in-the-state)
[93] Economic Survey Assam 2017-18

- **Kamrup College of Vocational Training (KCVT**)[94] - It offers its own structured courses as well as the Modular Employable Skills recognized by NCVT. At the intermediate level, KCVT offers courses like Stenography, Basics, Tally and DTP.
- **The George Telegraph Training Institute**[95] - The courses of George Telegraph training institute are affiliated by State Council of Vocational Training (SCVT). It offers both one year and two-year courses on Mechanic Radio/TV, Refrigeration and Air Conditioning, Mobile and telephone Repairing Technician, Automobile Engineering, Air-Conditioning and Refrigeration Engineering and Communication Skills.
- **Don Bosco Institute, Kharguli**[96] – It has been offering several vocational courses recognized by NCVT along with its wide variety of educational opportunities offered at various levels. The NCVT courses offered by it are CCA, DCA, Tally, Hardware, Networking, Hardware and Networking, DTP and Web Designing.
- **International Institute of Management Research**[97] **(IIMR)** - The IIMR conducts 18 months Diploma courses in Hotel Management and in Airlines Ticketing & Tourism Management for post matric students and a three-year degree in Hotel Management for post-class XII students.
- **Modern Professional Training Institute**[98] - Prominent among its technical courses are its diplomas offered in Computer Application and Computer Hardware, Video Editing and Video Photography. The non-technical courses offered are Montessori Training, Still Photography and Beauty Culture.

North East Skill Centre Guwahati

ASDM established the North East Skill Centre (NESC) in collaboration with ITEES, Singapore at Guwahati to provide quality skill training at par with international standard to the youth of the State. North East Skill Centre (NESC) is envisioned to become a premier institute in the field of skill development in Assam. NESC provide trainings under the following sectors: Retail, Beauty & Wellness, Hospitality- Housekeeping and Hospitality – F&B Services. The trainings are imparted through professionals who have got an extensive knowledge of the industry. The trainers undergo specialized Train the Trainer Program at Singapore delivered by resource person from ITEES, Singapore. NESC has tied up with all the major International, National and Regional Brands that are available in Assam for all the four trades. Some of the organizations that NESC has connected with include Vivanta, Novotel, Radisson, Levi's, Reliance, etc.

Source: https://skillmissionassam.org/domain-skilling/north-east-skill-centre

Vocationalisation of schools

Assam's school education network spread over its 30 districts has grown with time comprising of a total of 71,460 schools of which 48,567 alone are primary schools. Analyzing the number of schools by ownership status, it can be noted that 81% of the total schools in the State are either government or government aided suggesting that the State government has the major responsibility with respect to providing school education (especially elementary education). These schools across all categories (primary, upper primary, secondary, and higher secondary) together accounted for total enrolment of 6.9 million in the year 2016-17[99].

Interestingly, to reduce drop-out rates, increase enrolments and equip young people with employable skills, the State is also implementing the centrally sponsored scheme of

[94] https://www.kcvtghy.com/
[95] https://www.georgetelegraph.org/
[96] https://dbi.org.in
[97] http://iimrguwahati.com
[98] https://ampletrails.com/vtp-list/guwahati-modern-professional-training-institutempti--guwahati
[99] U-DISE 2016-17

vocationalisation at school level, i.e. RMSA. As compared to the national level where 4,084 schools imparted vocational education, 150 schools in Assam have been imparting vocational education under NSQF in the year 2016-17 across four sectors, namely Agriculture, BFSI, Retail and IT-ITeS. However, enrolment in these vocational courses is almost negligible pointing towards alarming situation of skilling in State's schools[100].

Though the State has been consistent in promoting and providing quality skilling infrastructure through both public and private institutes, there are still number of challenges that need to be addressed in order to achieve the envisaged objective of skilled and employed youth. Also, considering the reverse migration induced by COVID-19, there is an increased influx of jobless youth and individuals migrating back to the State. It is vital to draw attention towards upskilling and reskilling initiatives to harness the youth potential for sustainable progress in the State.

Entrepreneurship initiatives

The State promotes a culture of entrepreneurship by encouraging and empowering the youth to become job creators themselves as well as pursue their entrepreneurial dreams. Some of the initiatives undertaken by the State have been described below:

- **Startup Assam**: The 'Startup Assam' initiative was launched by the government of Assam with the intention to promote sustainable economic growth and generate large scale employment opportunities in the State. Under Assam Startup Policy 2017-2022, various incubation centres have been set up by the State government to facilitate the growth of at least 1,000 new start-ups over the upcoming years. The nodal agency of the initiative is the Department of Industries & Commerce and offers incentives for both start-ups and incubators in the State. The initiative offers an ecosystem of mentors, incubators, investors, partners, academic partners, centres of excellences and corporate partners for the start-ups to benefit from them[101].
- **Vocational training for tribal youth**: This scheme under the Ministry of Tribal Affairs aims to upgrade the skills of the tribal youth in various traditional as well as modern trades depending upon their educational background, current economic trends as well as marked potential that will help them to either acquire suitable employment opportunities or become self-employed. The scheme has been formulated exclusively for the scheduled tribes as well as primitive tribal groups and can be implemented across the country where remote tribal areas will be given maximum priority. A maximum assistance of INR 30,000 per annum per ST trainee is granted under the scheme. Also, non-recurring expenses @INR 0.48 lakhs per trade for five years is admissible under the scheme[102].
- **TRISSAM - Value Added Products from the Tribes of Assam**: It was launched under Pradhan Mantri Van Dhan Yojana (PMVDY) on 30th September 2020 to help the tribal population in the State. TRISSAM is the brand name under which products like joha rice, black rice, honey, jack fruit seeds, turmeric, bhootjolokia (king chilly), mushroom, black pepper, mustard oil, hill broom are produced mainly by the tribal population from forest resources of the State which are branded and marketed. This initiative was formulated with the objective of boosting entrepreneurship among the tribal people in the State and make them financially independent. The scheme envisions collecting forest products and marketing them with the required branding by Van Dhan Vikas Kendras (VDVK). TRIFED in Assam has currently been sanctioned around 50 Van Dhan Vikash Kendra (VDVK's) under the scheme covering 13 districts of the state[103].

Further, despite its strategic position in the north eastern region, abundant natural resources and higher proportion of young population, Assam has been unable to unleash its growth potential to the fullest which can be primarily attributed to limited availability of skilled workforce suggesting that its skilling ecosystem is mired with several challenges which need to be addressed on an immediate basis. In this

[100] U-DISE 2016-17
[101] https://startup.assam.gov.in/
[102] NITI Aayog - Report of Working Group IV Strengthening Skill and Entrepreneurship Landscape in Indian Himalayan Region
[103] https://trifed.tribal.gov.in/node/1338

context, the next sub-section delves into the rationale for establishing a dedicated Skill University which would address the issues of the existing TVET landscape of the State and make skilling more attractive among the local youth.

1.3. Rationale for the Assam Skill University

Assam, at present, is facing the twin challenges of increasing unemployment and a mushrooming young population. The working age population generally lacks skills as required by local industries. Many students obtain higher education every year, but most of them remain unemployed because of non-availability of proportional jobs within the State matching their education and skills. Though skill development is one of the priority agendas of the State government as reflected by the creation of a robust State Skill Development Mission, endowed with the responsibility of meeting the entire value chain's requirements of appropriately skilled manpower both in quantity and quality, the core problem faced by the State is the low employability, especially of its youth. One of the major reason is mismatch between the delivery cost to impart training viz a viz the paying capacity which impacts quality and thereby employability. Even the candidates graduating through formal channels of higher education have been facing the challenges of being industry ready and employable.

This can be primarily attributed to some challenges with which the state's training ecosystem is mired with which makes the idea of skill training non-lucrative. Some of these challenges include lack of an integrated education and skilling approach, inadequate training infrastructure, shortage of quality trainers and instructors, low women participation, inadequate strategy to reach out to candidates dropped out before batch freezing through drop-out counselling, limited to no mapping of aspirations of youth, inadequate focused counselling for skill training programmes as a result of higher focus on achievement of targets (commencement and trained numbers) and poor focus on improving soft skills in addition to technical skills with a focused approach. These challenges have been delved in detail in section 1.2.1 of the report.

These challenges in the skills ecosystem reduces their chance of securing decent, high paying jobs leaving them with meagre local job opportunities in the formal sector.

Lack of employability skills has repeatedly been echoed by industries, industry associations and various other stakeholders as a part of numerous studies. The higher education system not only in Assam but the country as a whole seems to be imparting theoretical or knowledge-based learning making students less employable. In 2018–2019, the employment rate for graduates from polytechnics and engineering colleges was around 32–34%, while that for graduates from ITIs was a little over 50%[104]. In addition, as per MoLE Report on Employment & Unemployment Situation in India 2015-16, more than 50% of total unemployed graduate/post-graduate/ certificate/diploma holders stated unavailability of jobs matching with their skills as the primary reason for their unemployment stressing the need for industry/market relevant skilling, reskilling and upskilling. This underlines the need for a 'Finishing School' concept/model that would address all above mentioned issues and challenges of the existing skilling ecosystem at national and State level.

Taking cognizance of abovementioned issues and challenges with respect to skills ecosystem at national and State level, the government came up with the concept of Skill Universities. Such Skill Universities as envisaged in National Policy for Skill Development and Entrepreneurship 2015 are expected to offer industry-aligned skills training programs leading to NSQF level 5 and above qualifications ensuring pathways for progression and mobility through multiple entry and exist channels. In addition, Skill Universities' would also undertake applied research and development (R&D) as per industry requirements, conduct ToTs serving needs of quality trainers of general education and TVET institutes and serve as a hub for promoting quality and industry relevant training courses and programs.

[104] AICTE, NCVT MIS

In August 2020, complying to University Grants Commission regulations, the State's Legislative Assembly passed the Assam Skill University Bill for establishing Assam Skill University (ASU). The University is expected to serve as a one stop TVET solution for the entire north eastern region of the country filling gaps in the existing training and higher education system. The government also expects ASU to cater to skilling needs of industries in neighbouring countries such as Bangladesh, Bhutan, Myanmar and Nepal facing similar challenges. ASU shall be established in Mangaldoi, located about 74 km east of Guwahati with estimated 60,000 square meter of built-up space and having good connectivity to neighbouring States and countries. Further, based on numerous ADB studies, Mangaldoi has been identified as a potential manufacturing center for electrical equipment, electronics, plastics, and pharmaceuticals. This provides ASU a competitive edge over other institutes in the State due to significant placement and industry exposure opportunities for students and faculty members. Moreover, with major infrastructure projects such as hydropower, multimodal logistics parks, etc. which are either ongoing or are in the pipeline, Assam will require highly skilled manpower, especially at NSQF level 5 and above reiterating the need for ASU[105].

The University campus shall comprise of Administrative building, Academic Blocks, Workshops and Laboratories, Library Block, Computer Centre, Media Production Centre, Auditorium &amp, Convention Centre, Canteen, Incubation and entrepreneurship centre, Residential complex, Student service centre and numerous recreational activities for students. Several interim campuses including North East Skill Center, and ITI Guwahati have been identified to commence pilot training courses in January 2021 under the Assam Skill University[106].

Establishing the need for a Skills University

The establishment of "skill universities" was envisaged in the National Policy for Skill Development and Entrepreneurship 2015. Skill universities are expected to offer industry-aligned skills education and training programs with multiple entry and exit options leading to NSQF level 5 qualifications and above (diploma, advance diploma, B. Voc., post-graduate diploma, M. Voc., and Ph.D.) which are integrated with higher education to ensure pathways for progression and mobility. They would also conduct industry-relevant applied research and development (R&D), train trainers, instructors, and faculty members of ITIs, polytechnics, and enginbeering colleges, and promote and ensure quality and industry relevance of training courses and programs provided by various vocational training and education institutions.

One of the main objectives of setting up a skills university is to **formalise the TVET ecosystem** since the tag of a 'university' attached to a vocational institution is expected to negate the issue of skilling being generally perceived to be inferior to the conventional education system, i.e. the skill university will **make skilling aspirational among youth**. Moreover, in the Indian and State context, new and evolved jobs will gradually emerge as a consequence of its demographic dividend and industry 4.0 technologies which are slowly making their way across almost all sectors of the economy. Thus, a skills university will essentially either **undertake or outsource demand-assessment/labour market and skill gap studies** across sectors on a periodic basis and accordingly modify, design new courses or even discontinue some. These cutting-edge labour market studies will also help to **inform and direct policies.** Further, skills university will focus on not just general education but also **work-integration as well as lifelong training** with **multiple entry and exit points between vocational education, general education, technical education and job market**. In addition, **partnerships (both industry and institutional)** form the foundation of any skills development/ general education project. Similarly, skills university will ensure that relevant industry and other strategic partners become important stakeholders in demand mapping, course design, training, work integration, employment, research projects, etc[107].

[105] Final concept paper of Assam Skill University Project: ADB, Dec 2020
[106] Note sheet for PMU recruitment shared by ASDM
[107] Based on consultations with ASDM team and some of Assam based institutions

A skill university puts emphasis on 'vocation' based learning. A skill university aims to combine the classroom learning with practical learning experience, eventually equipping candidates to be more prepared and do justice to the career they choose to pursue. Skill universities are expected to emerge as foremost institutions of skill based education recognised by employers, nationally and internationally in the next few years. These higher educational institutions would provide opportunities for flexible learning, recognition of prior learning (RPL), competency-based modular courses and credit accumulation/ transfer across educational streams for continuous learning.

The concept of skill universities anticipated in the National Education Policy 2020 (NEP) sets out to reform the higher education system into a multidisciplinary and flexible system with multiple entry and exit points by integrating professional education and vocational education. More reforms of the higher education system are proposed in NEP to address issues such as insufficient emphasis on students' creativity and entrepreneurship skills, rigid separation of disciplines and narrow specialization; inadequate faculty qualifications and career management; lack of faculty engagement with and quality of research; and suboptimal institutional governance and leadership. Since around 2017, several skill universities which adopt various operating models have emerged across the country.

Key enabling differentiators of the skill university

Based on research of some skill universities (such as Shri Vishwakarma Skills University, Bhartiya Skill Development University, Teamlease Skills University, etc.) it was found that the key differentiators of a skill university are:

- **Robust Credit System:** The credit system of a skill university would be different from that of others, yet be robust to provide opportunities for multiple entry and exit, allow shift in career choice, provide equivalence in comparison to the other universities. The credit system devised should also be such that it clearly and transparently defines concepts such as transferable skills, core skills and soft skills so as to allow flexible career pathway and leave room for course correction if the candidate does feel the need to change his/her area of specialization. Thus, the evaluation methods should be aligned to the practiced teaching methods, clearly lay down assessment parameters and tools, and reduce any room for misinterpretation.

- **Research:** Skill development ecosystem in the Indian context is still evolving. This puts increased dependence on the need to carry out research in this space. The researchers at the skill university will conduct research with a focus on human development aspects. The research will be carried out in identified priority areas such as labour market development, HR requirement in select sectors, evolving training pedagogy to improve learning outcomes, conduct futuristic studies such as impact of automation on workforce and the resultant implications for workforce development, amongst others. The research carried out would help university in identifying focus areas of training, and improving design of curriculum and assessments.

- **On the Job Training/ Apprenticeship:** Unlike other universities, the curriculum at the skill university shall mandate that the student undergoes an apprenticeship training with a company in the field of his/her interest. This compulsory industry training will ensure that the student acquires hands on learning at the workplace and thus increase the employability of the student. On the other hand, the students will also get a chance to apply theoretical knowledge in a real corporate setting and interact with experienced personnel at their workplace. This practical experience will not only enhance the students' confidence but also provide them with an opportunity to evaluate career options in their field of interests.

- **Employment Linkages:** The focus at the skill university will be towards ensuring placement for all its students by: (i) using the multiple industry contacts of the university, and (ii) increasing the student's employability via apprenticeship programs. Thus, unlike other vocational education training programs, where the focus is on training and assessment only, the skill university will facilitate employment opportunities for students to pursue a successful career.

- **Technology enabled environment:** The skill university would be state of the art and technologically well equipped with practical labs, simulation zones and online platform to encourage peer to peer interactions. Simulation zones would be built to recreate scenarios which are otherwise impossible to set up as a laboratory like atmosphere by providing students with real world problems. For example, construction sites – lifting of heavy equipment can be simulated through the use of software. Presently, the use of technology in vocational education colleges is minimal. Hence, increased use of technology will help increase student's retention rate, enhance student's understanding of curriculum, and establish a better connect with students.

Critical success factors

It is for a Skill University to identify the critical factors or activities required for ensuring its success. The elements / functions of the University such as infrastructure & processes, funding, curricula, governance & administration, alliances, faculty and students sourcing, futuristic skilling etc. have been identified to be critical for effective functioning of the proposed University and needs to be designed at par with national and global standards to deliver quality output and ensure sustainability of the University. Establishing the multi skill development Skill University would involve participation of all stakeholders in the skilling value chain and management of all the critical factors identified to ensure it meets the defined objectives.

Figure 11: Critical factors for a successful skill university

1.4. Vision, Mission and Objectives of the Assam Skill University

The core pillar of the Assam Skill University will be its vision and mission which shall guide the University towards preparing a pool of skilled manpower and entrepreneurs in the State and north eastern part of the country. While the objectives of ASU have been well articulated in the Assam Skill University bill, its mission (overall purpose of ASU, i.e. what it will be doing for the next one to three years) and vision (hopes ASU will be going in the future if they can fulfil their mission) needs to be drafted for successful achievement of its objectives. A draft vision of ASU has been presented below (this will require discussion with key stakeholders).

Vision[108]

[108] Developed based on consultations with ASDM

To become a leader in TVET in the north eastern region of the country acknowledged by people, industry and society supporting the transition of traditional based education and economic system to a skill, knowledge and innovation base by providing high calibre educational experience, ensuring student access and success and offering a rich diverse and inclusive environment.

Mission[109]

- ✓ Offer occupation-ready skill courses
- ✓ Authentic learning facilities
- ✓ Champion education technologies implementation
- ✓ Enterprise-institution cooperation model for close industry linkages
- ✓ Entrepreneurship innovation center to support start-ups
- ✓ Provide a platform for self-employment and entrepreneurship capability
- ✓ Improve the quality of trainers, instructors and faculty members
- ✓ Nurture talent for local and national requirements
- ✓ Holistic learning experience for the students
- ✓ To commit to equality, diversity and inclusion as a fundamental part of the university

Objectives

Key objectives of the Assam Skill University (as enshrined in the Assam Skill University Bill 2019) are:

a) to emerge as one of the foremost institution of quality in skill education recognized by industry, nationally and internationally.

b) to develop qualified youth with skill proficiency and competency at different levels as per National/State qualifications of skill education.

c) to promote skill education in an integrated and holistic manner with higher education to ensure pathways for progression and mobility.

d) to provide opportunities for flexible learning systems and skill development.

e) to frame credit framework for competency-based skill and vocational education.

f) to exchange expertise and best practices in support of skill developments efforts with any other college, institution, organization, university etc.

g) to disseminate knowledge/skill through seminars, conferences, executive education programmes, community development programmes, publications and training programmes.

h) to undertake programmes for the training and development of faculty members and teachers of the University and other institutions.

i) to undertake collaborative research and development with other organizations.

j) to create entrepreneurs by providing necessary skill and support.

k) to provide consultancy to government, semi-government, public and private industries.

l) to create an Industry Academia partnership by inviting industry and institutions for mutual benefits.

[109] Developed based on consultations with ASDM

m) to ensure that the standard of degree, diploma, certificates and other academic distinctions are not lower than those laid down by statutory regulatory authorities in India; and to pursue any other objects, as may be prescribed.

1.5. Infrastructure of the University

The campus of the proposed Assam Skill University shall be the home-away-from-home for students as well as staff during their academic association with the university. It is therefore important for the campus to provide a conducive environment for lifelong learning and cooperation between industry and academia. The assumptions for infrastructure of the proposed university has been developed based on inferences drawn from the leading national and international institutes and best practices have been considered while estimating the infrastructure of the institute.

The permanent campus of the ASU will have close to 83 acres at its disposal in Mangaldoi, the district headquarters of Darrang. The proposed campus will have all the modern learning resource facilities to execute quality research, learning and teaching. The university will have 9 schools and 4 centres offering programmes from NSQF level 4 to 10. The University will host infrastructural facilities in terms of classrooms, laboratories, workshops, staff quarters, residential facility for faculty, students and guests, stadium, administrative block, canteen, food court and community centre. The university will also have dedicated area for other support services such as security office, sheeting shed area (parking area, academic to classroom, construction shed, generator shed) and an open-air theatre of which 50% will be covered. The table below provides a summary of the infrastructure which would be available on the campus:

Table 5: Overview of infrastructure that would be available at ASU

Building/Block	Total Plinth Area	Building/Block	Total Plinth Area
Administration Building	6945	Hostel Type-B	1965
All Classroom Block Building	11080	Canteen	553
Covered Corridor	596	MP Hall Building	1900
Labs (both 1 and 2)	12900	Community Centre	1526
Lab-1	6450	Toilet Block	48
Lab-2	6450	Food Court	742
Workshop & Store	2763	Sub-Station & Pump Room	200
Staff Quarter - Type-2	639	POL Room	119
Staff Quarter - Type-3	468	Security Office	264
Staff Quarter - Type-4	639	Stadium	513
Staff Quarter - Type-5	143	RCC Covered Corridor	1144
Faculty Hostel Building	2854	Food Court	460
Guest House Building	2220	Hostel to hostel	342
Hostel Type-A	2640	Hostel to hostel	342
Open air theatre	200	Sheeting shed area	3102

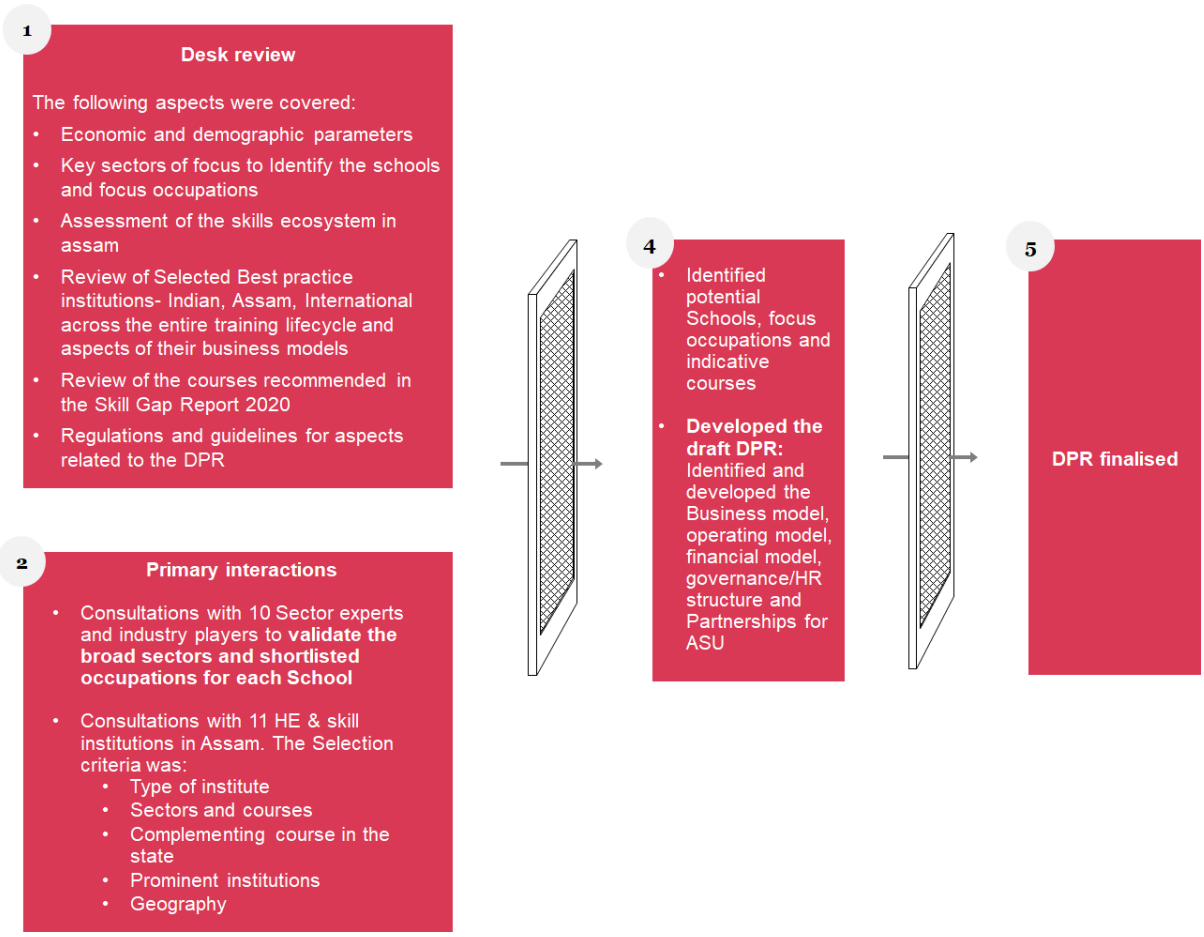
Source: Based on Engineer's estimate shared by ASDM

2. Methodology

A multi-fold methodology was adopted to *develop the DPR for the Assam Skill University.* The overall methodology adopted was a mix of '**Research oriented'**, involving secondary research such as the review of the economic and skills context of the State, Assam skill gap report to identify the sectors having maximum incremental demand as well as a review of regulations to develop various aspects of the business model, operating model, governance structure etc. and a detailed review of international and national best practices to draw relevant learnings. The process has also been '**Consultative**', engaging with ASDM and ADB team members, 11 Assam based institutions and 10 sectoral experts/industries[110]. The approach was complemented by a '**mixed method study design'** ensuring a blend of both quantitative and qualitative research.

The exhibit below illustrates the overall approach and methodology adopted for finalizing sectors, schools and occupations for the skill university:

Figure 12: Approach and Methodology for developing the DPR



[110] The list of stakeholders (sector experts, Assam education institutes) interacted with is attached is Annexure II.

3. Overview of Schools, Centers, Occupations and Courses

Triangulating the key output from the secondary and primary analysis undertaken, 13 Schools and Centers have been identified which the Assam Skill University can consider operationalizing. The proposed Schools are aligned with key existing and emerging sectors and sub-sectors, whereas the Centers are cross-cutting in nature.

The 9 Schools and 4 Centers proposed are:

1. School of Agricultural and Food Technology
2. School of Technology
3. School of Design and Creativity
4. School of Manufacturing and Construction
5. School of Sustainability
6. School of Mobility
7. School of Management and Finance
8. School of Tourism, Hospitality and Wellness
9. School of Healthcare
10. Center for Entrepreneurship and Innovation
11. Center for Life Skills and Languages
12. Center for Lifelong Learning (distance learning and online learning)
13. Center for Faculty and Curriculum Development

The table on the next page provides an overview of potential focus areas, occupations and indicative programs.

It must be noted that the focus areas, occupations and courses are indicative in nature and will be updated, added or validated by a thorough market research and critical inputs from the industry and academic experts.

3.1. Schools and Centers at ASU

Table 6: Finalized schools, centers- their focus areas and occupations

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
School of Agricultural and Food Technology	**Agriculture and Food Technology**	• Food technology • Agriculture sciences • Meat, fish processing and packaging • Agriculture farm advisory • Quality Control, Certification and Traceability			• B. Voc/ bachelor's in agriculture science (specialization in tea, bamboo, horticulture, etc.) • B. Voc in Food Processing and Technology • M.Voc in agri science, food processing & technology • Diploma in Agriculture
	Tea	• Tea tasting • Tea Processing and Product Development • Tea Estate Management • Tea Plantation (sowing, sorting, etc.) technology			• Certificate Course in Tea Tasting • Certificate course in Tea Management • PG Diploma in Tea • PG Diploma in Tea Management • Diploma in Tea Husbandry and Technology
	Bamboo Technology	• Post-harvest management (handling, storage, processing)			• Diploma in Bamboo Technology • Modular Course on Bamboo Application Technology
	Horticulture (including spices)	• Nursery staffing (sequencing, pesticide management, water management) • Product development and innovation			• Diploma in Horticulture • Certificate course on cultivation of plants, crops and flowering plants • Certificate course on organic grower, cultivator
	Animal Husbandry, Sericulture and Fisheries	• Farm preservation • Sericulturist			• Certificate course on farm risk management • Certificate in Crop Protection • Certificate in Sericulture • Diploma in Sericulture • Diploma in Animal Husbandry and Dairying

[111] This list is not exhaustive and is indicative in nature and will be validated by the Markey Research Agency and the Academic Team once onboarded

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
School of Technology	**Information Technology**	• Business Process Re-engineering • Application Development • Application Deployment & Maintenance • IT Infrastructure Architect • DTP / Tally			• B. Voc in Informational Technology • BSc Data Science • B. Voc in Software Development • B. Voc. in Computer & Peripherals, Maintenance, Service & Repair • Bachelor's/Master's in computer science • Certificate courses in DTP / Tally • Certificate course in software development, security infra specialist • Diploma in Architect Identity and Access Management • Diploma IT Infrastructure Management • Certificate in Computer & Peripherals-Maintenance, Service & repair
	Data Analytics, AI and Cloud	• Data Analysis • Data Engineering (machine learning, algorithm, languages- Python, SQL, etc.) • Data Science (focus on fintech as well) • Solution Architect (data and cloud architects)			• Diploma in Data Scientist and Data Architect • Certificate courses in Data Engineering • Certificate courses in ML Engineering • Modular courses in fintech, digital transformation • Diploma in Data Analytics
	New age Technologies	• IoT • Blockchain (focus on fintech as well) • AR and VR • Cyber security (focus on fintech as well) • 3D printing • GIS and modelling (O&G) • Building Information modelling • SCADA • Fibre optics (Splicer Technician)			• Big Data Certification • Internet of Things Certification • Artificial Intelligence Certification • Robotics Certification • Blockchain Certification • Design Thinking Certification • Diploma in GIS and Modelling
School of Design and Creativity	**Design**	• Fashion design • Textile Design • Industrial Design • Handloom/ Handicraft design			• B. Voc in fashion design • B. Voc in Textile design • B. Voc Craft & Design • Diploma in Fashion Design • B. Des in Industrial Design • Diploma in Handloom and Textile Technology

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
					• Certificate course for CAD for Textiles • Diploma in Creative Textile Design • Textile Designer- Jacquard Handloom
	Media and Communication Studies	• Animation • Gaming • Lighting artist • VFX • Motion graphics • Digital Content Creation • Music production technology • Film making			• B. Voc in Media, entertainment and communication • B. Voc in Global Media and Communications • Advance Diploma in Visual Effects • Certificate courses in 3D Animation, Game Designing, Graphics, Digital Photography and Web Designing • BSc/ BA in Filmmaking with Specialisations • B. Voc. in 3D Animation & VFX • B. Voc. in Web Development/Design
School of Manufacturing and Construction	**Mechatronics and Robotics**	• Pneumatics • PLC and Automation • Microcontrollers • Production control systems • Hydraulics • Robotics • Automated manufacturing (textile)			• B. Voc/ M. Voc In Mechatronics • PG Diploma in Structural Engineering Design • B.Voc. (Production-Tool and Die Manufacturing) • Advance Diploma in Integrated Mechanical & Electrical Design • Mechatronics Engineering • B. Voc/ M.Voc. (Robotics and Automation) • Diploma in Engineering (Mechatronics) • Diploma in Robotics and Automation • Certified Course in Mechatronic
	Engineering	• Aircraft Engineering • Biomedical Medical Engineering			• Aeronautical Engineering • B. Tech/B.Sc./B. E in Biomedical
	O&G	• Fire and Safety Courses • Calibration and Instrumentation Specialist • Welder • Fitter • Wiring / Electrical technicians • PLC Programming			• Diploma in Fire Technology & Industrial Safety Management • Certificate in Fire Technician • Certificate/STTs in Industrial Welding, Fitting and electronics • Certificate Course in Process Instrument Technician • Diploma in PLC
	Electronics	• Electronics Technicians (specialisations in Solar technology, etc)			• B. Voc (Solar Technology) • Certificate in Solar PV installer • Certificate in Solar PV maintenance Technician • Diploma in Solar Technician (electrical)

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
					• Certificate in Electric Appliance Services & Maintenance
	Metal technology	• CNC • Metal works technicians • Ferry Maintenance Crew • Ferry/boat Assembly			• Certificate in CNC Programming and Operation • Certificate courses in Ferry Maintenance and Assembly • Certificate in fabrication
	Building and Construction	• Heavy machine operators (specialized jobs) • Vertical transport • Tunnel blasting • Drilling • Rigging • Fabrication • Construction and building materials (bamboo) • Track and bridge maintenance (railways) • Bridge inspection (railways) • Mechanic Technician for water and sanitation building technology (Plumbing) • Building information modelling • Green building technology (energy efficiency, zero discharge)			• B. Voc construction management • M.Voc in construction technology • Certificate in blasting • Certificate in machine operations • Certificate in fabrication • Bachelors in Bamboo Construction and Building • Bachelor's in Sustainable Materials and Green Buildings • Diploma in Mechanical Engineering with specialization in Vertical Transportation • Advance Diploma in Built Environment (Vertical Transportation) • Certificate in Vertical Transport • Certificate Building Construction Technology • Certificate in Electric Appliance Services & Maintenance • Diploma Industrial Electrical
School of Sustainability	**Climate change, Environment and Sustainability**	• Clean Energy (micro grids, solar technology • Circular economy (GIS, modelling, resource management, recycling by-products of the O&G industry, etc.) • Climate resilience (infrastructure) • Health and safety • Water resource management • Rainwater harvesting • Groundwater recharge			• MBA in Energy Management • B. Voc in Renewable Energy • Certificate Course in Artificial Recharge to Groundwater • B. Voc in Solar Technology • Diploma in Waste Management • Certificate in Solar Panel & Photovoltaic • Certificate in Water Harvesting and Management • Certificate in Sustainable Blue Economy

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
		• Biochemical Engineering (bamboo to ethanol) • Blue economy • Sustainability (waste management, environment management, recycling- part of manufacturing) • Sewage Management • Bio medical Waste Management			
School of Mobility	**Logistics and Supply Chain**	• Warehouse Operations • EXIM Logistics, Freight Forwarding and Custom Clearance Agent • Supply chain and Inventory management • Distribution services (large and smaller consumer goods)			• B. Voc/M. Voc in logistics and supply chain • MBA (Logistics & Supply Chain Management) • Advance diploma in Logistics & Supply Chain Technology Services • B. Voc in International Logistics • Certificate in Logistics and Transport • Certificate in Warehouse operations and inventory management
	Ports and Inland Water Transport	• Port Operations			• Certificate in KPIs for Ports and Terminals • Diploma in Port Management
	Civil Aviation	• Passenger Airline operations related occupations: • Ground staff- operations • In-flight crew • Security			• Certificate in KPIs for Ports and Terminals • Certificate in Aviation and Hospitality Services
School of Management and Finance	**Management**	• Financial Management • HR Management • Agri-business Management • Health Management • Entertainment Management • Sports Business management and sports celebrity management (Sports sponsorships) • Branding, advertising and marketing (focus sectors- Tea, spices, aviation, tourism, hospitality, fashion, retail, traditional crafts, agriculture, etc.)			• B. Voc. in Banking, Financial Services & Insurance Skills • B. Voc. in Agriculture Farmhouse Management • B. Voc. in E-Commerce & Digital Marketing Skills • Diploma in Marketing Managerial Skills • B. Voc. in Retail Managerial Skills • B. Voc. in Customer Relationship Management • Certificate in Apparel Retailing and Visual Merchandising • Advance Diploma in Export Import Management • MBA/BBA

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
		focussing both on online and offline marketing • Store management • Inventory management • Customer service and engagement			
	Banking, Insurance and Financial Services	• Financial Services • Finance & Accounts			• Certificate course in Accounts Executive • Certificate in GST Accounts Assistant • Diploma in Computerizes Financial Accounting Skills
School of Tourism, Hospitality and Wellness	**Tourism and Hospitality**	• Hotel Management (Front office, housekeeping, F&B Services, Production, Finance, HR, Purchase, safety, Hotel Engineering) • Culinary Arts • Ticketing (civil aviation, tourism, etc. • Agro, eco-tourism • Adventure tourism			• B. Voc. in Hospitality & Hotel Management • Diploma in Hospitality & Hotel Management • Diploma in Travels and Tour Management • Diploma Food & Beverage Production • Diploma in Food & Beverage Service Management • Diploma Front Office • Diploma in House Keeping • B.Sc. in Hotel Management
	Wellness	• Beauty & Salon (sub-sectors: skincare, nail, makeup, tattoo) • Salon management • Cosmetology • Different kind of therapies (Ayurveda and natural therapy) • Yoga • Swimming coach			• Diploma in Beauty Cosmetology • Diploma in Salon Centre Management • Certificate in Yoga and Naturopathy • Diploma in Naturopathy • Certificate in Ayurvedic Beauty Therapy • Certificate in Integrated Yoga Therapy
School of Healthcare	**Healthcare and Health Technology**	• Medical lab technology • Nursing • Counsellors • Home healthcare • Paramedical staff • OT Technicians • Cardiac care Technicians, sports physiotherapy • Para-veterinary science • High performance fitness and physiotherapy			• Diploma in Dietician Assistant • Certificate course in GDA (equivalent to Ward Helper), Emergency Medical Technician, Health Sanitary Inspector, Home Health Aide • Diploma in Medical Lab Technology • Diploma in Para veterinary Clinical Assistant • Certificate Course in Physiotherapy

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
		• Nutrition (Dietician) (focus on sports)			
Center for Entrepreneurship and Innovation	Focus on start-ups, entrepreneurship for grassroots and incubation	• This Center will be crosscutting all the other Schools and Centers			• Modular programs/Certificate on aspects related to entrepreneurship such as business plan development, prototyping, market access, funding, etc.
Center for Life Skills and Languages	Focus on developing soft skills modules and English language modules	• This Center will be crosscutting all the other Schools and Centers			• Modules/Certificate on soft skills and language
Center for Lifelong Learning (distance learning and online learning)	Focus on coordinating with other schools and running distance and online programs[112]	• This Center will be crosscutting all the other Schools and Centers			-
Center for Faculty and Curriculum Development	Focus will be to undertake capacity building and research on enhancing quality of in-house and external TVET faculty. Further, focus on developing innovative curriculum	• This Center will be crosscutting all the other Schools and Centers			• Short programs/Certificate on faculty development • Certificate on improved pedagogy • Certificate on innovative curriculum development

[112] As per the UGC Online Education Regulations 2018, it is required for an institution to have been in existence for atleast 5 years and accredited by NAAC to run online programs.

Potential Schools/ Centers	Focus areas	Potential Occupations	Types of programs (proposed)		Indicative courses/programs[111]
			Long term	Short - medium term	
	pedagogy in collaboration with the industry, SMEs, SSCs, etc.				

3.2. Types of programs and pathway at ASU

The pathway charted for ASU provide students flexibility to enter and exit at the end of each year with an equivalent degree/diploma/certificate. Further, it provides opportunities for mature students to take up credits for upskilling as well. Moreover, the recommended pathways offer students the flexibility to complete additional credits (if any) to obtain a degree/diploma as guided for a specific program.

There are two potential pathways (Bachelors of Vocation (B. Voc) and Masters of Vocation (M. Voc) as developed by UGC and Diploma in Vocation (D. Voc) pathway as developed by AICTE) that may be integrated with each other at the Assam Skill University. As a result, students will have the option of flexible entry and exit after completing each certificate/degree/diploma.

Further, advanced skill-based Certificate programs and modular entrepreneurship programs may be developed and undertaken at the university. These programs shall be curated based on existing units/modules or additional modules (as recommended by the industry partner or academic experts) for the B.Voc to Research Pathway, therefore giving flexibility to students in terms of choosing to study specific topics, diploma, or degree.

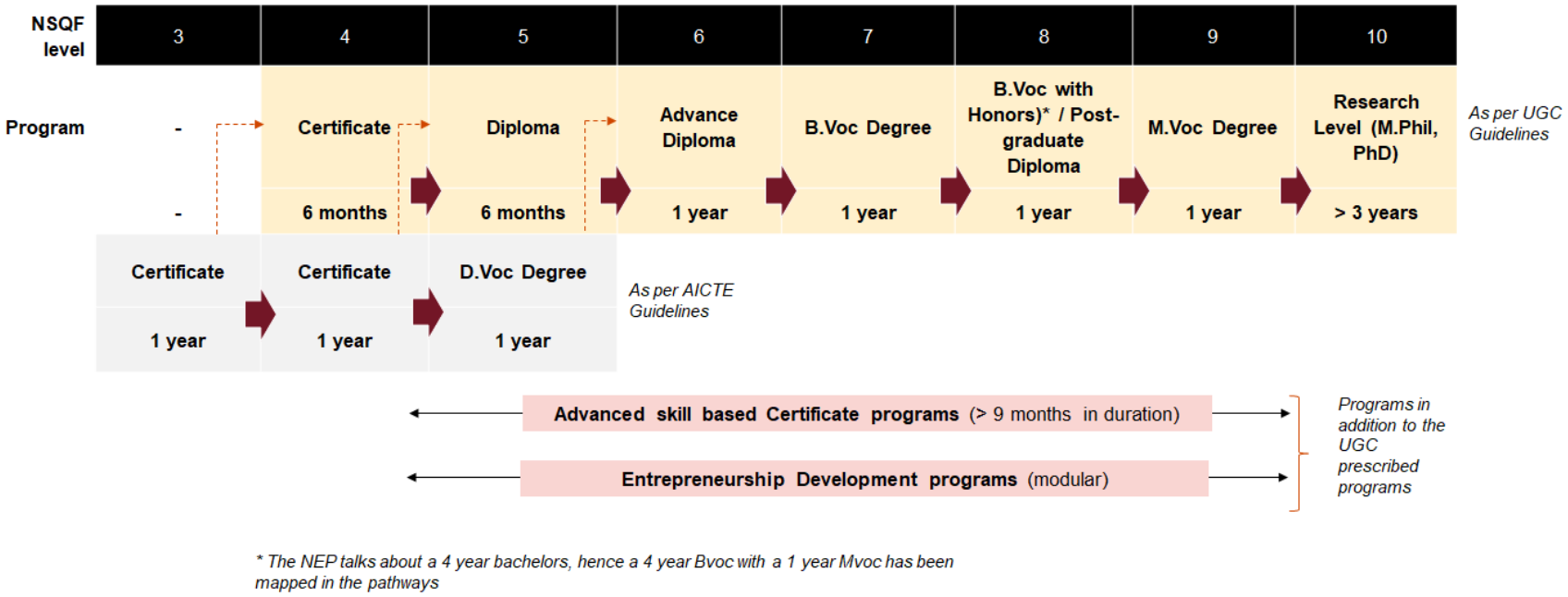
The figure below provides a visual representation of the envisaged programs. It is an indicative pathway and may evolve once revised UGC guidelines are notified based on the National Education Policy (NEP) 2020. It is recommended that ASU adopts a 4 year Bachelors of Vocation (B.Voc) degree (with the 3 year leading to regular B.Voc degree, whereas the 4th year will lead to a B.Voc degree with Honours/Research) in consideration with the NEP's focus on a Bachelor's degree extendable to 4 years.

Apprenticeship:

- For internal students ASU may consider integrating Apprenticeship or an On the Job Training component withon the programs. In order to implement apprenticeship to its students on the B.Voc, D.Voc or M.Voc pathway, ASU will have to align with the UGC Guidelines for Higher Education Institutions to offer Apprenticeship/Internship embedded Degree Programme, 2020.

- For external students, ASU can register as a 'Basic Training Provider' as per the Guidelines for Implementation Of "National Apprenticeship Promotion Scheme", (As Per Operational Framework) For Apprenticeship in India (updated as on 1st October 2019).

Figure 13: Students progression to different categories with multiple entry and exit options



3.3. School-wise student ramp-up

The projected school-wise student ramp up over the 10-year period is given below:

Table 7: Projected School and Center-wise student ramp-up

Student Ramp up - Overall (By School) (indicative)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
School of Manufacturing and Construction	300	420	540	1,060	1,190	1,320	1,450	1,610	1,610	1,610
School of Management and Finance	300	420	540	1,060	1,190	1,320	1,450	1,610	1,610	1,610
School of Agriculture and Food Technology	300	420	540	1,060	1,190	1,320	1,450	1,610	1,610	1,610
School of Technology	300	420	540	1,000	1,120	1,240	1,360	1,510	1,510	1,510
School of Sustainability	-	-	-	360	480	660	780	780	780	780
School of Design and Creativity	-	-	-	300	360	480	540	540	540	540
School of Mobility	-	-	-	300	360	420	540	540	540	540
School of Tourism, Hospitality and Wellness	-	-	-	300	360	420	540	540	540	540
School of Healthcare	-	-	-	240	300	420	540	600	600	600
Center for Entrepreneurship and Innovation	180	180	180	300	300	300	300	300	300	300
Center for Life Skills and Languages	-	-	-	180	180	180	180	180	180	180
Center for Lifelong Learning (distance learning and online learning)	-	-	-	180	180	180	180	180	180	180
Center for Faculty and Curriculum Development	180	180	180	300	300	300	480	480	480	480
Gross Enrolment – Full time programme + Certification	1,560	2,040	2,520	6,640	7,510	8,560	9,790	10,480	10,480	10,480
Less: Dropouts	36	60	84	210	255	309	348	370	370	370
Net Enrolment – Full time programme + Certification	1,524	1,980	2,436	6,430	7,255	8,251	9,442	10,110	10,110	10,110
Net Enrollments - MDP/FDP	0	0	0	100	100	200	200	300	400	400

Student Ramp up - Overall (By School) (indicative)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Enrollments	**1,524**	**1,980**	**2,436**	**6,530**	**7,355**	**8,451**	**9,642**	**10,410**	**10,510**	**10,510**

4. Operating Model

This section covers key aspects of the proposed operating model of the Assam Skill University. Starting from the overall conceptual academic delivery model, to the type of programs and pathways that they can consider providing to students. It also identifies the potential target segments and the entry-exit and flexibility avenues for each. Further, the overall curriculum development framework, credit framework and assessment and evaluation methodologies have been defined in alignment with national regulations, best practices (Indian and international). To enable widespread education opportunities, a framework for remote learning and inclusion has been delved into.

Considering the dearth of quality trainers not only in Assam but also in the rest of the country, a holistic TVET teacher development framework has been developed. Focus on research is imperative for a university, hence it is recommended that ASU should have a strong mechanism for facilitating the same. Additionally, to boost the entrepreneurship and start-up ecosystem, key strategies have been identified.

Lastly, the section focusses on push and pull strategies and mechanisms for effective potential student outreach, mobilization and admission as well as facilitating career development to develop an employable workforce. The overall operating model for the skill university has been developed with the overall objective of growing and sustaining a diverse and inclusive learning environment.

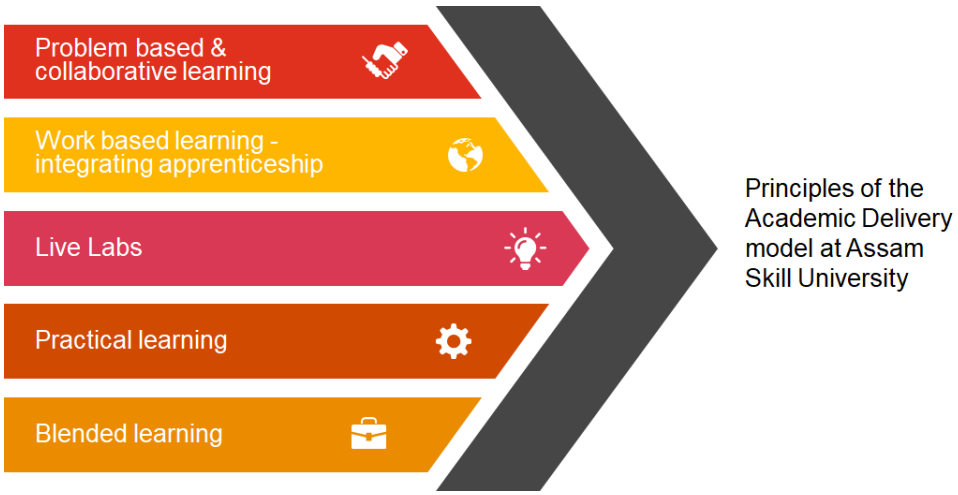
4.1. Academic Delivery Model

The traditional teaching method in any educational set-up primarily comprises of lectures being given to groups of students complimented by tutorials and workshops and with some type of independent study. Inspired by the German Dual System of Training, all programs at ASU may be run in collaboration with one or more industry partner. Key benefit of this will be to ensure employability of passing out students. Industry partnerships can be forged to develop and deliver the program as well as play a role in screening and engaging applicants.

The proposed model has been developed in alignment with national regulations, quality framework proposed by NAAC and QCI, NIRF as well as Indian and international best practices. Further, it has been envisioned based on the larger guidance provided by the National Education Policy 2020 that aims to reforms the education ecosystem in India.

Key elements or principles of the academic delivery model suggested for the Assam Skill University are:

Figure 14: Key principles of ASU'S proposed Academic Delivey Model



- **Problem based and collaborative learning**: While in traditional teaching method it is the lecturer who generally gives students information or the answers to their questions, in problem-based learning, students are presented with a problem rather than a solution making students more active in their learning. This also helps students to improve communication and team working and practice research and information processing. Further, collaborative learning can be facilitated amongst students through learning from their peers and seniors guiding them in group activities to discuss materials with their peers and solve problems.
- **Work based learning:** In this mode of delivery, students are provided with real-life work experiences to further aid their learning and improve their employability skills. Through internships or field trips, workplace learning is integrated into the curriculum to allow students gain practical knowledge as well. Internships will be facilitated through the UGC's Apprenticeship HEI norms for students and On-the-job training sessions.
- **Live Labs:** Students enrolled in the entrepreneurship programs/courses have the opportunity to develop and run live labs. These may include home stays off campus, small cafe/canteen, etc. This will enable the students to gain hands-on learning and troubleshooting while running their business.
- **Practical learning:** Practical learning may be facilitated through the state-of-art workshops and labs on campus.
- **Blended learning**: Also known as hybrid learning, in this delivery mode, traditional classroom teaching is combined with online learning and independent study. This gives students enough control over time, pace and style of their learning.

Thus, it is recommended that all the programs/training courses at ASU should be facilitated mainly through a classroom-based teaching as this would enable better interaction between faculty/instructors/trainers and students and lead to more involved learning. Further, most of the training courses would also require better visualization of the concepts taught, an additional use of simulations, laboratory assignments and field training. Also, as outlined in the scope of work, ASU shall use E-learning as a mode of delivery to supplement the basic modes of delivery. E-learning can also be used to connect guest faculty/ external faculty members for providing training to its students.

4.1.1. Student Target Segments

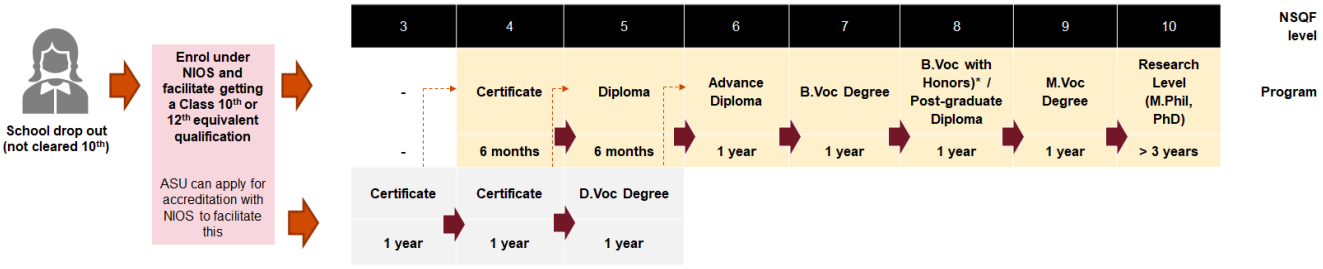
The Skill University can consider targeting students from a variety of backgrounds and geographical regions with key focus on women, students with disabilities and from backward communities, especially tribal belts to promote inclusive learning. The potential target audience for the skill university include:

- School dropouts, 10th Pass
- 12th pass
- Skill trained youth
- ITI graduates
- Polytechnic graduates
- Bachelors and Masters graduates
- Entrepreneurs - aspiring and existing
- Employed applicants

Further, applicants are envisaged to apply from within Assam, the rest of India (especially the neighboring north-eastern states) and international students (from countries such as Bhutan, Nepal, Bangladesh, etc.).

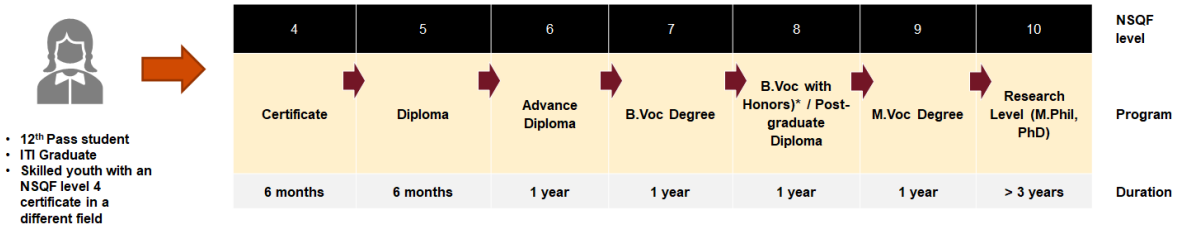
The potential pathway for each target segment may be as follows:

Potential Target Segment 1: School dropout (not cleared 10th), 10th Pass and 12th Pass youth

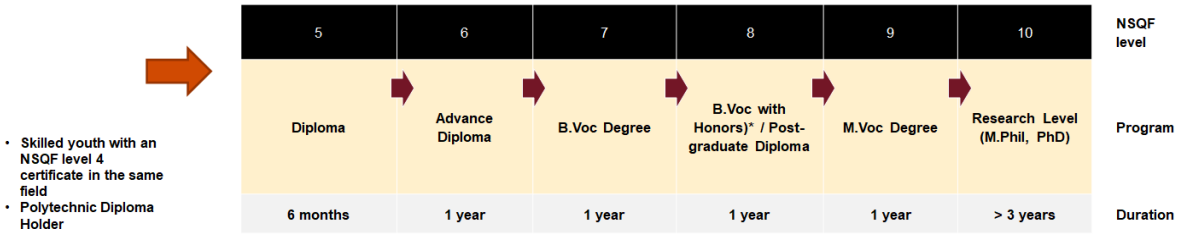


10th Passed students may directly enrol in the level 3 Certificate program. Further, as per the UGC guidelines, ASU may offer RPL for NSQF level 4 and above roles, enabling entry of youth with prior skills in the B. Voc programme.

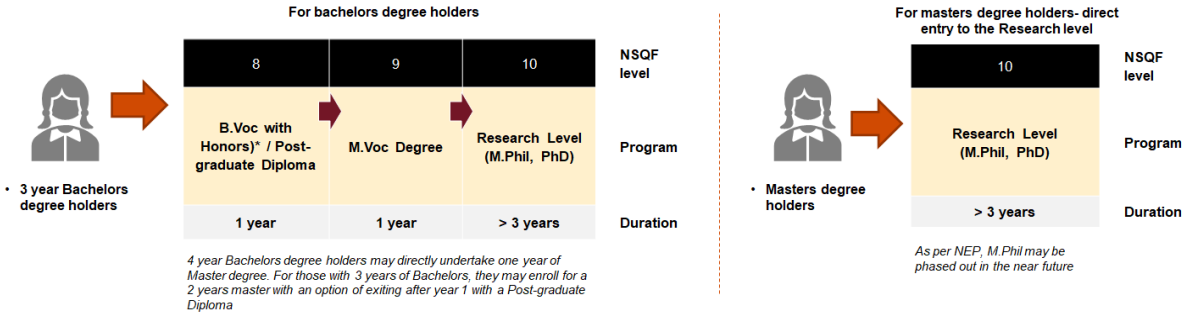
Potential Target Segment 2: ITI Graduates, skilled youth with an NSQF level 4 certificate in a different field



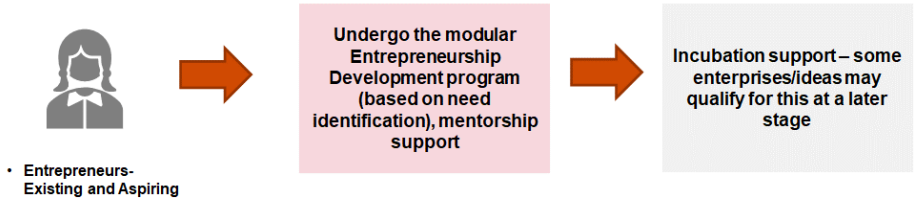
Potential Target Segment 3: Skilled youth with an NSQF level 4 certificate in the same field, Polytechnic Diploma Holders



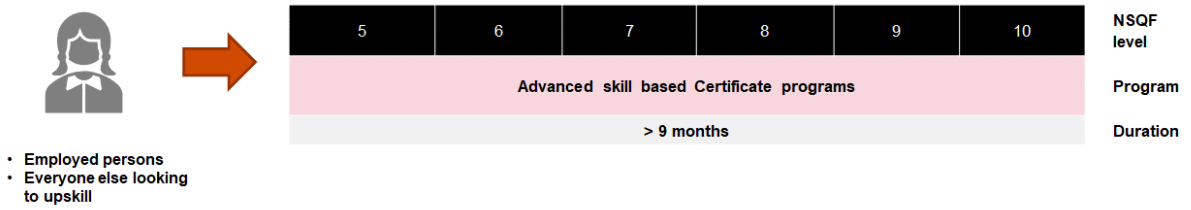
Potential Target Segment 4: Degree holders (bachelors/masters)



Potential Target Segment 5: Existing/Potential Entrepreneurs



Potential Target Segment 6: Open to everyone meeting the requisite eligibility criteria set for each course



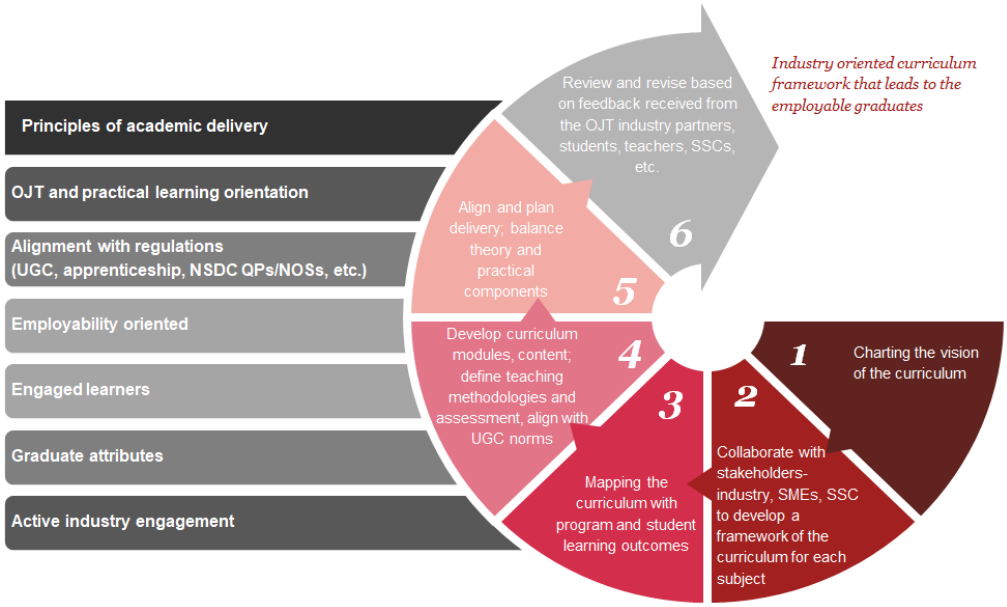
Note: The depicted scenarios of entry for the identified target segment are identified based on the guidelines and intend to provide as much flexibility for students and persons from all educational/professional background to avail the benefits of vocational education enabling their employability. Further, these are indicative in nature and may be revised based on any new UGC guidelines that may be notified in light of the National Education Policy 2020. Additionally, eligibility for each course will vary impacting the qualification requirement for students.

4.1.2. Curriculum Development Framework

Assam Skill University can consider having a Curriculum development framework which is based on learning outcomes as they would be useful for designing the course for students to choose programs and for employers to recognise qualifications. The framework would enable the skill university to articulate not only what students will learn but also describe the process of how they will learn, be taught and assessed irrespective of the course/programme and will help drive pedagogical innovation. The proposed framework would ensure that curriculum is such that highest standards are achieved to facilitate student engagement and success. In addition, it is suggested that ASU considers gender sensitivity, indigenous community and PWDs lens while designing the curriculum and pedagogy

framework to avoid gender stereotypes, remove barriers and improve outcomes. Some of the aspects which may be considered by ASU to embed principles of inclusivity in curriculum development include acknowledging any limitations in the demographic representation of course material, contextualizing course materials and using diverse range of voices and perspectives across course content. The exhibit below details out the overall approach and methodology of the curriculum design framework.

Figure 15: Proposed curriculum development framework



The framework consists of six steps with seven integrated elements aligned to the principles of the academic delivery model and it must be noted that each step is not meant to be linear and that each step may overlap or be run parallelly with other development activities. Each of the steps is explained briefly below:

Step 1: Curriculum Vision: This step would involve envisioning the future curriculum taking input and feedback from current students and alumni and some key stakeholders such as industry bodies and employers. The curriculum development framework team in this step shall consider the skills, knowledge and attributes a graduate need to acquire in the next 5-10 years to be employable. Depending on the type of program/course, this stage would require academic staff to 'horizon scan' within their own domain and identify changes in the way in which graduates will be expected to work in the future.

Step 2: Participation: This step sets out the basic premise that the programme teams should not design and develop curricula without active participation of all those who shall be impacted (directly or indirectly) by what is being taught such as students, employers, other key stakeholders and relevant professional bodies. This can be done by organizing advisory and stakeholder group meetings or seminars and/or involving individuals at various points of the university events.

Step 3: Mapping the Curriculum: This step would involve writing programme learning outcomes and mapping where these are addressed and assessed. It must be noted that programme learning outcomes would be developed with the graduate attributes in mind. The curriculum map shall also examine the structure of each stage of the programme in terms of number and size of modules.

Step 4: Design: In terms of curriculum development, the design step shall be of paramount importance to successfully run a programme. During this phase, the teams would develop modules, identify the programmes/courses learning and teaching and assessment strategies that shall be adopted.

Step 5: Align and Plan Delivery: In this step, it would be crucial to check the alignment of the outcomes, learning and teaching plan and assessment strategies. In addition, programme teams will ensure that the planned curriculum is compatible to the resources/infrastructure available. Moreover,

the programme team will also evaluate the requirements in terms of specialist teaching staff, facilities and consumables that would be required for a holistic learning experience.

Step 6: Review and Revise: The continuous review and revision of the curriculum of various programmes will be important from a quality assurance point of view and will help ASU to be at the forefront of programme design and delivery. Thus, it is suggested that the academic/curriculum development team should seek every opportunity to review and revise the curricula. Some of the ways which can be explored for this purpose include student and industry feedback, Board of Studies, Academic Council, etc.

Moreover, it is recommended that wherever relevant, the curriculum should necessarily be aligned to Qualification Packs (QPs)/ National Occupational Standards (NOSs) of selected job role(s) within the industry sector(s). Wherever the curriculum is not available, the same may be developed in consultation with the relevant Sector Skill Councils and industry partners. While doing so, they may work towards aligning the curriculum with the NOS being developed by the respective/allied SSC[113]. Further, while designing the course curriculum and content, following parameters may be defined by the proposed university at the very beginning.

Figure 16: Key considerations while designing the curriculum (indicative)

The curriculum development approaches that can be adopted by the Skill University are shown in the exhibit below:

Figure 17: Proposed curriculum develpment approaches

➢ Need Analysis	• ASU in partnership with employers/industries can undertake a short skill gap analysis (both technical and soft) and accordingly design curriculum to address the identified skill gaps.
➢ Committee/ Council based	• ASU can develop its own curriculum and get it approved and implemented by Academic Council/Board of Studies. Also, it can either form a review/advisory committee or get the Academic Council to review the content, curriculum, learning outcomes and structure of courses.
➢ SMEs	• ASU can rope in subject matter experts to design the curriculum in consultation with industry partners/other training providers.

According to UGC guidelines, curriculum development for each program in the university broadly has two main aspects (i) skill component (60% credit) (ii) general component (40% credit). The focus of skill development component should be towards enhancing employability of students through appropriate mix of knowledge, practice and attitude. All the teaching content should be as per various sector specialisations based on each job role and level of the credit rating framework. However, while designing the skill development component of the curriculum, there are some key aspects that ASU may consider which are listed below:

- **Mapping to National Occupational Standards/ QPs**: ASU can consider aligning the curriculum to QPs or NOSs of various job roles shortlisted for ASU with the objective of enabling its students meet the learning outcomes/ NSQF level descriptors as envisaged in NOSs.
- **Industry expert's engagement**: It is suggested that Industry should be the focal point during curriculum development process and thus major industry experts should be consulted to ensure

[113] UGC B. Voc guidelines

sector relevance of the designed curriculum. Also, like many national and international institutes of repute, a constant dialogue should exist with these experts with a view to updating the course as per changing market needs. Other aspects of making industry critical part of ASU would be through inviting them for guest lectures which will give students an opportunity to interact with sector specialists and gain a more holistic understanding of their respective sectors/trades.

- **Practical component**: Practical knowledge is of paramount importance to make students job ready regardless of the level or semester that they are pursuing. This can be achieved by ASU by supplementing its theory-based lectures with labs and workshops enabling students develop their capability to apply what they learn within the classroom setting.
- **Avenues for exploring On the Job training (OJT)/ Apprenticeships**: By providing students OJT or offering apprenticeship opportunities, the issue of information asymmetry between employers and students can be resolved. OJT or Apprenticeship enables students to understand employers' expectations from them as and when they become part of labour market and enable employers to observe the student's proficiency of the desired skill sets. Through creating opportunities for students to get internships or apprenticeships with companies would give them exposure to real work environment and make them employable in future. These joint lessons of classroom and work site will enhance the students basic, industry specific and cognitive skills.
- **Use of innovative technology-based solutions**: Currently, many national and international institutes are using innovative ICT tools for imparting seamless education and training to students since technology increases access to learning and simplifies the learning process. For example, having a well- designed computer multimedia can help prepare students to build their basics foundation. However, it is imperative for ASU to understand what the students need to learn, subsequently define learning outcomes and then use an integrated planning approach to use multimedia for effective training delivery. Interestingly, the Skill University can make use of simulation programs to create real wok scenarios. For example, in construction sites – lifting of heavy equipment can be simulated using software. Lastly, any material used within lectures can be made available online so that students can refer to them as and when required.
- **Industry exposure visits**: A few aspects of the curriculum should also have a component of industry visits requiring students to visit companies enabling students apply their classroom learning to a real-life situation while being mentored by a variety of industry experts. While it gives industrial exposure and practical knowledge, students chances of seeking internship and placement opportunities also increases. For example, taking students pursuing a tourism and hospitality specialization, to a hotel or restaurant. These industry visits will give the students more practical exposure and aid their entire learning cycle.
- ASU should be wary of the fact that curriculum does not include content on certain specializations that have high probability of getting replaced in view of mechanization (i.e. industry 4.0 technologies) in the future, especially routine based tasks and jobs requiring lot of manual labour.

While technical skills will remain the indispensable foundation for a strong career, in order to ensure career progression and longevity, these technical capabilities will need to be supplemented by social/generic skills. This combination will enable an individual to work in different occupation settings and conditions and will go a long way in sustaining the employability of the students. Thus, while designing the general or life skills component of the curriculum, ASU can consider or incorporate the following aspects:

- **Language skills**: Since bilingual people are more easily employable, there should be courses for both English and a second language. For example, Kerala offers Arabic classes for students specializing within the construction sector to open their avenues for seeking employment in the Middle East. In fact, many metropolitan cities in the country offer German, French and Spanish for enhancing job seeking chances in these countries.
- **Student Centric**: All the coursework can be designed in such a way that it encourages student centric education supporting life-long learning i.e. even after a student graduates from ASU, he or she is equipped or capable of learning. This student centric pedagogical model would comprise of high impact learning strategies, promoting self-awareness and integrating the 5S methodology.

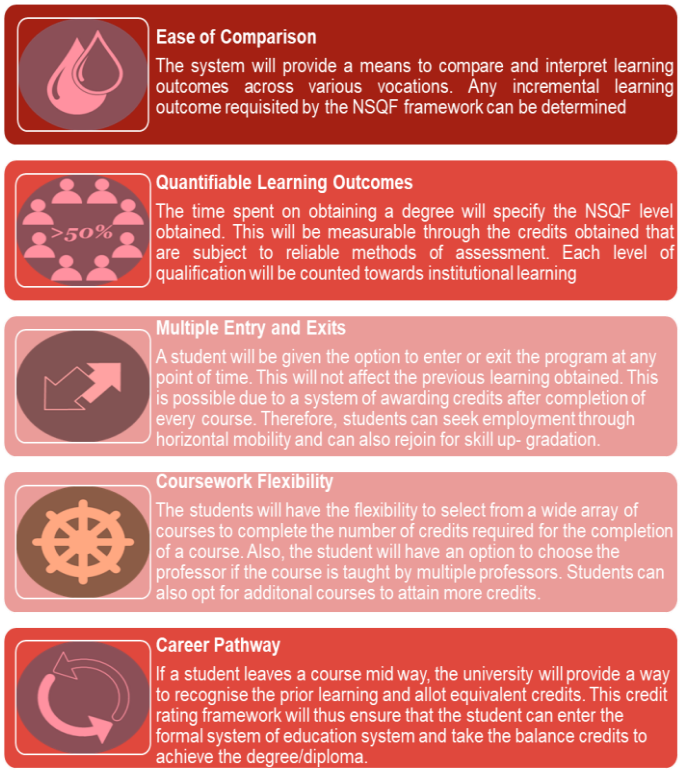
- **Soft Skills**: They are often related to motivation, integrity, and interpersonal interaction and often depict personality traits of an individual such as teamwork, emotional intelligence, critical thinking, management and leadership skills, etc. It is these skill sets that would allow students to contribute more meaningfully towards their work and society. Broadly, these skills will be required by almost all industries; however, the degree of demand for these skills will vary based on the type of industry and job family. ASU can ensure that the curriculum and teaching methods incorporate components of non-cognitive and socio-emotional skills.
- **Extra-Curricular activities**: It is important to have some credits reserved towards co-curricular activities (such as games, sports, fine or performing arts, volunteer service, etc.) in the general component of the curriculum. This would give students a holistic learning process in the ASU.

The general education component would adhere to the normal University standards offering courses which provide holistic development. The curriculum can be decided by the Board of Studies of ASU and may also include the course(s) which are supportive to core trade. In addition, in consultation with the ASU management the possibility of adopting international curriculum without NSQF alignment for identified courses for which Indian competency standards are not mapped to international ones shall be explored, to enable international mobility of students in those countries.

4.1.3. Credit Framework

A well conceptualized Credit Framework would be critical to the success of ASU, given the importance it puts to vocational aspects of training. The credit framework also needs to be cognizant of multiple means of academic learning which in the case of a skill university could be diverse ranging from traditional methods such as classroom and lab based learning to new age methods of training such as simulation labs, project learning, onsite training, on the job training and apprenticeships.

Figure 18: Benefits of credit rating framework



Given that a substantial number of students would be from economically weaker sections and as enshrined in its Bill, it is imperative to offer flexible entry and exit options to candidates to take up employment after reaching pre-defined milestones. It is suggested that the credit system devised should be such that it clearly and transparently defines concepts such as transferable skills, core skills and soft skills so as to allow flexible career pathway and leave room for course correction if the candidate does feel the need to change his/her area of specialization. ASU can consider aligning the evaluation methods to the practiced teaching methods and clearly lay down assessment parameters and tools and reduce any room for misinterpretation. The key benefits of such a framework are described in the exhibit on the right.

The concept of credit has been widely used across the globe by both developing and developed countries for secondary, higher, and adult education. For example, in the USA a 4-year degree requires 120 credit hours, whereas, the European Credit Transfer and Accumulation System, mandates a full study year to have 60 credits.

Some of the prominent features of the proposed credit framework for ASU include:

- **Semester based system (comprising about 18 weeks each)**
- **Multiple entry and exit options**
- **Maximum of 70:30 split of credits across the skill and general component (as mandated by UGC)**
- **Integration of apprenticeship opportunities across the programs**
- **30 credits per semester (i.e. 60 credits in a year)**
- **Choice-based credit system[114] and provide provisions for credit transfer across courses**

According to UGC, the following formula should be used for conversion of time into credit hours:

- One Credit would be equivalent to 15 periods of 60 minutes each, for theory, workshops/labs and tutorials
- For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops
- For self-learning (which is based on e-content or otherwise), the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

The exhibit below summarizes the formula derived for calculation of credits from ASU's perspective:

Table 8: Formula for credit calculation in ASU

Category	Hour	Credit
Theory	15	1
Practical	30	1
Fieldwork/ OJT/ Apprenticeship	30	1

Source: *UGC Guidelines for B.Voc.*

In order to ensure adequate mix of skill (competency/vocational skill building) and knowledge (general) based content, the content of all vocational courses needs to be carefully curated giving student's opportunity to supplement their sector specific knowledge with general life and communication skills. University Grants Commission has recommended that the breakup between the general and skill component of the credit system should be approximately 40% and 60% (may be expanded up to 3-% and 70% respectively).

The proposed credit framework for ASU has been developed keeping in mind relevant regulations and guidelines as well as the larger guiding framework provided by the National Education Policy (2020). Ministry of Human Resource Development. Key Guidelines and Regulations referred to are:

- Guidelines (Revised) for Providing Skill Based Education under National Skills Qualification Framework
- Credit Framework, Skills and Education under NSQF, Skill Assessment Matrix for Vocational Advancement of Youth (SAMVAY), Ministry of Human Resource Development
- UGC Guidelines for Curricula Aspects, Assessment Criteria and Credit System in Skill Based Vocational Courses under National Skills Qualification Framework
- UGC (Credit Framework for Online Learning Courses through SWAYAM, Regulation, 2016
- UGC Guidelines for Higher Education Institutions to Offer Apprenticeship/Internship embedded Degree Programme, 2020

[114] This will allow for flexibility in the education system, so that students depending upon their interests and aims can choose interdisciplinary, intra-disciplinary and skill-based courses (UGC Guidelines on Minimum Course Curriculum For Undergraduate Courses Under Choice Based Credit System)

- The Apprentices Act, 1961 [Act No. 52 of 19611 as amended by 27 of 19732, 41 of 19863, 4 of 19974, 36 of 20075 and 29 of 20146
- UGC (Minimum Standards and Procedure for Awards of M. Phil/Ph. D Degrees), Regulations, 2009

The table on the next page shows an indicative breakup of credits (disaggregated by year and type of learning) based on these guidelines.

Figure 19: Key points considered while developing the credit framework

It must be noted that:

- The credit ratio between Theory to Skills (practical + OJT/Fieldwork/Apprenticeship) component ranges from 40:60 to 30:70 (as prescribed by UGC). In the last few semesters of each program, the credits split may allow for more focus on OJT/Apprenticeship opportunities.
- Considering the diversity of schools at ASU, the credit ratio may vary based on the extent of OJT/Apprenticeship requirements. For instance, the School of Manufacturing and Construction may lay more thrust on OJT.
- The definite spilt of credits and hours will be determined for each course through in-depth consultations with the Industry partner, Academic experts and SSCs.
- The Credits and hours may vary for each course depending on the NOS (hour requirements) as well as suggestions of the Industry partner and academic
- The New Education Policy 2020 highlights that introduction of 4 year Bachelors programs, hence the 4th year may be a B.Voc Degree with honours. The terminology may change once the UGC guidelines for a 4 year B.Voc have been declared. Further, new UGC guidelines may be released in the coming years, the credit framework will have to adapted accordingly.
- Each semester approximately is of 18 weeks leading to about 36 weeks per year. While a typical academic year in India is about 30 weeks, additional 6 weeks (from the 8 weeks of vacation) have been added to enable students to dedicate more time to OJT/Apprenticeship in addition to theory and practical (labs and workshops).
- The table is indicative in nature and only provides the potential credit and hour split based on the regulations and other best practices

INDICATIVE

Table 9: Overview of year wise credits and hours (INDICATIVE)

Equivalence	Duration	Semesters	NSQF Level	Credits			Hours		
				General Learning (credits)	Skill (credits) includes practical (lab & workshop), OJT/apprenticeship/fieldwork	Total credits	General Learning (hours)	Skill (hours) includes practicals (lab & workshop), OJT/apprenticeship/fieldwork	Total Hours
Certificate	1 year	2	3	24	36	60	360	1080	1440
Certificate	1 year	2	4	24	36	60	360	1080	1440
D.Voc Degree	1 year	2	5	20	40	60	300	1200	1500
Total D.Voc		**6**		**68**	**112**	**180**	**1020**	**3360**	**4380**
Certificate	6 months	1	4	13	17	30	195	510	705
Diploma	1 year (cumulative- includes the 6-month Certificate)	1	5	11	19	30	165	570	735
Advanced Diploma	1 year	2	6	24	36	60	360	1080	1440
B. Voc	1 year	2	7	20	40	60	300	1200	1500
B. Voc Degree (Honours)* / Post graduate Diploma	1 year	2	8	20	40	60	300	1200	1500
Total B. Voc		**8**		**88**	**152**	**240**	**1320**	**4560**	**5880**
M.Voc	1 year	1	9	23	37	60	195	1050	1245
PhD	> 3 years		10		8 to 16 credits as mandated by UGC (4 credits for Research Methodology)	As per UGC Minimum standards and procedure for award of M. Phil and PhD, 2016)			

For NSQF level 4 and below courses these can be aligned to existing NOSs and QPs. In case of non-availability of NOS in a specific area / job role, the university/college can consider getting the curriculum for this developed in consultation with relevant industry experts.

UGC allows for the skill component to be a minimum of 60% and extendable up to a maximum of 70% of the total credits. Therefore, for certain schools (such as Technology, Engineering and Construction, Agriculture, etc.) where the practical component may require more weightage, this structure may be altered.

Further, ASU may consider facilitating a means to recognise and assess prior learning for students who already possess the requisite knowledge and skills for some of the university's courses. This can be done through the RPL framework by conducting assessment and certification through respective SSCs/ DGET. This will help students attain equivalent credits and they will then only have to take up reaming courses towards required for the fulfilment of the diploma or degree.

Sample D. Voc framework

Based on the year-wise contact hours and credits described above, course structure for the B Voc. Program which ASU can consider running is illustrated below. The proposed structure can be used as a reference or starting point which can be customized later on the basis of job roles and other specializations offered by ASU.

INDICATIVE

Table 10: Overview of year wise credits and hours for D.Voc (INDICATIVE)

Type of Module	YEAR 1				YEAR 2				YEAR 3			
	S1		S2		S3		S4		S5		S6	
	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours
Theory									4	60	4	60
Theory	4	60	2	30	4	60	2	30	4	60	4	60
Theory	3	45	3	45	3	45	3	45	2	30	2	30
Theory	2	30	2	30	2	30	2	30				
Theory	4	60	4	60	4	60	4	60				
Practical	3	90	3	90	3	90	3	90	2	60	2	60
Practical	3	90	3	90	3	90	3	90	2	60	2	60
Practical	2	60	3	90	2	60	3	90	2	60	2	60
Practical	2	60			2	60						
Fieldwork/ OJT/ Apprenticeship*	7	210	10	300	7	210	10	300	14	420	14	420
Total	**30**	**705**	**30**	**735**	**30**	**705**	**30**	**735**	**30**	**750**	**30**	**750**

Note:

1. Theory-practical credit split has been considered as per D.VOC AICTE guidelines
2. Theory- skills hour split in alignment with SAMVAY

3. Apprenticeship is a minimum of 20% of the total credits each year - as per UGS HEI Apprenticeship guidelines
4. OJT/apprenticeship assumed to be 8hours and 6 working days a per Apprenticeship Act 1961
5. Theory and practical assumed to be 6 hours per day, 6 days based on SAMVAY guidelines
6. Credit ratio for OJT/apprenticeship in alignment with UGC B.VOC guidelines

Sample B. Voc framework

INDICATIVE

Table 11: Overview of year wise credits and hours for B.Voc (INDICATIVE)

Type of Module	YEAR 1				YEAR 2				YEAR 3				YEAR 4			
	S1		S2		S3		S4		S5		S6		S7		S8	
	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours	Credit	Hours
Theory									4	60	4	60	4	60	4	60
Theory	4	60	2	30	4	60	2	30	4	60	4	60	4	60	4	60
Theory	3	45	3	45	3	45	3	45	2	30	2	30	2	30	2	30
Theory	2	30	2	30	2	30	2	30								
Theory	4	60	4	60	4	60	4	60								
Practical	3	90	3	90	3	90	3	90	2	60	2	60	2	60	2	60
Practical	3	90	3	90	3	90	3	90	2	60	2	60	2	60	2	60
Practical	2	60	3	90	2	60	3	90	2	60	2	60	2	60	2	60
Practical	2	60			2	60										
Fieldwork/ OJT/ Apprenticeship*	7	210	10	300	7	210	10	300	14	420	14	420	14	420	14	420
Total	**30**	**705**	**30**	**735**	**30**	**705**	**30**	**735**	**30**	**750**	**30**	**750**	**30**	**750**	**30**	**750**

Note:

1. Theory-practical credit split is considered as per B.VOC UGC guidelines
2. Theory- skills hour split in alignment with SAMVAY
3. Apprenticeship is a minimum of 20% of the total credits each year - as per UGS HEI Apprenticeship guidelines
4. OJT/apprenticeship assumed to be 8hours and 6 working days a per Apprenticeship Act 1961
5. Theory and practical assumed to be 6 hours per day, 6 days based on SAMVAY guidelines
6. Credit ratio for OJT/apprenticeship in alignment with UGC B.VOC guidelines

Sample M. Voc framework

INDICATIVE

Table 12: Overview of credits and hours for M.Voc (INDICATIVE)

Type of Module	YEAR 1			
	S1		S2	
	Credit	Hours	Credit	Hours
Theory	3	45	3	45
Theory	3	45	3	45
Theory	2	30	2	30
Theory	2	30	2	30
Theory	2	30	1	15
Theory	1	15	1	15
Practical	1	30	1	30
Practical	2	60	2	60
Practical	2	60	1	30
Practical	1	30	2	60
Practical	2	60	3	90
Fieldwork/ OJT/ Apprenticeship*	9	270	9	270
Total	**30**	**705**	**30**	**720**

Note:

1. Theory-practical credit split is considered as per B.VOC UGC guidelines
2. Theory- skills hour split in alignment with SAMVAY
3. Apprenticeship is a minimum of 20% of the total credits each year - as per UGS HEI Apprenticeship guidelines
4. OJT/apprenticeship assumed to be 8hours and 6 working days a per Apprenticeship Act 1961
5. Theory and practical assumed to be 6 hours per day, 6 days based on SAMVAY guidelines
6. Credit ratio for OJT/apprenticeship in alignment with UGC B.VOC guidelines

Credit Transfer

In an evolving labour market, enabling students to transfer credits internally (within ASU) as well as from online courses to ASU or from other institutions, universities in India and abroad will provide pathways in the true sense. Therefore, ASU can consider undertaking the following to enable this:

- Recognise courses on the MOOC SWAYAM portal for credit transfer. For this, ASU will have to make amendments to its Ordinances, Rules, Regulations to incorporate provisions for transfer of credits for MOOCs courses as per UGC Regulations[115]
- Integration with the national Academic Bank of Credit is another avenue. As envisaged in the National Education Policy 2020, an Academic Bank of Credit (ABC)[116] shall be established which would digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded considering credits earned. ASU can aim to integrate its credits with ABC to ease opportunities for students and provide flexibility. Please note that the nuances of availing this, will be clearer once the guidelines for the ABC have been developed by UGC.
- Accept students who may have studied and passed the assessment of the same QP at any other institution or Training provider

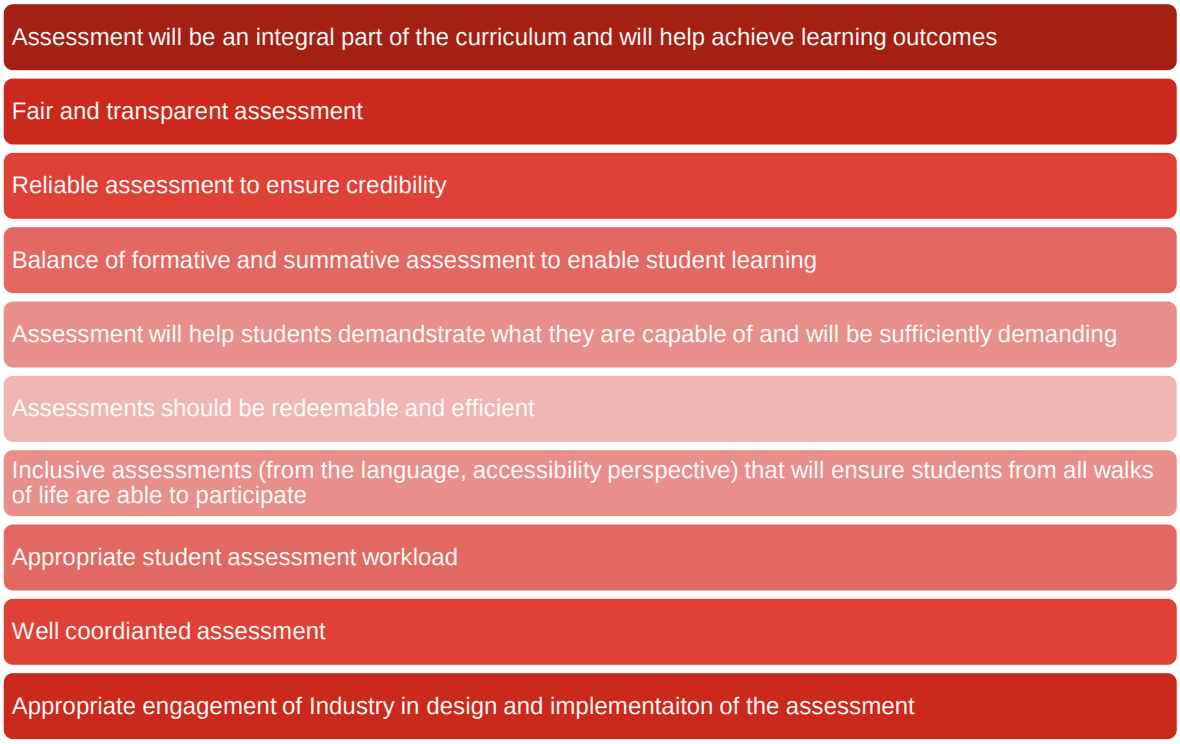
[115] UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016
[116] National Education Policy 2020

- For technology and engineering related courses, AICTE as part of Coursera for Campus Coursera's Coronavirus Response Initiative allows students to undertake courses/credits on coursera. Thus, enabling credit transfer from online courses provided by them[117].
- For international exchange programs, ASU can collaborate with specific institutions and map credits of relevant course accordingly. Otherwise, for non-partner institutions, World Education Services or its partner agencies, evaluate Indian credits in comparison to the University that the student chooses to go to.

4.1.4. Assessment and Evaluation framework

It is recommended that the general education component should be assessed and evaluated adhering to UGC guidelines on Examination Reforms for General Education and ASU's prevailing standards and procedures. Some of the key principles of the proposed Assessment and Student Evaluation Framework are shown in the exhibit below:

Figure 20: Principles of proposed Assessment & Evaluation Framework



UGC Revised Guidelines for providing Skill Based Education under National Skills Qualifications Framework recommends that assessment of skill component should primarily focus on practical demonstrations of the skills acquired. While designing the examination and assessment pattern for the skill development components, the university may consult the respective SSCs and also consider using the designated assessors of SSCs/industry associations undertaking practical assessments. However, in case of absence of SSC for a specific trade, the assessment may be done by an allied SSC or the Industry partner. This kind of external assessment and evaluation shall continue only until the proposed university develops its own assessment frameworks and assessors. In addition, ASU may issue a joint certificate for the course(s) with respective SSCs whenever it may deem fit.

[117] https://www.aicte-india.org/sites/default/files/CIRCULAR_COURSERA.pdf

For the general component, ASU can design norms based on examinations type and type of skill being measured. For example, students can be made to read materials such as newspapers or magazines, or participate in extempore sessions for assessing their English competency, etc.

To ensure transferability of credits, ASU can consider ensuring quality and recognised assessment based on UGC norms and requirements of the partner institution or online portal.

ASU can consider carrying out assessments in each semester (i) mid-term exams (ii) final or end term exams. The result of both the exams would then be converted into grades based on a well-defined grading scheme. Combined with the bi-annual assessments, ASU can incorporate formative assessment methods such as quizzes, classroom polls, concept maps, peer-to-peer tests. Partnerships with top rated assessment agencies should be forged for QP as well as non-QP aligned courses. In keeping with courses identified, international and national assessment agency collaborations can be identified. Leveraging digital technology such as assessments through the Learning Management System, gamification of assessments will improve retention and digital skills. Innovative assessment methods for life skill/soft skill programs such as podcasts, vlogs can also be undertaken. These can be easily managed if the program is being implemented remotely for improving student confidence and personality development. Some of the examination types which ASU can explore are listed below:

Formative Assessments:

- **Oral presentations and exams**: Also known as Vivas, such exams are quite useful for testing student's ability to verbally communicate key concepts, theories and ideas covered in their course.
- **Take home exams**: This type of exam has a format and expectations similar to written exams with only exception that it is done at home. In this type of exam, students have the freedom to take question papers home and then through secondary research and discussion seek answers to the questions.
- **Laboratory work**: This type of exam tests students on practical skills and techniques required either in a lab setting or through simulated programs. For example, for tourism and hospitality specialization, especially those for front desk job roles, the students should be made to handle a real-world customer instead of making his list down ways to handle an angry customer.
- **Projects:** Students (especially those undertaking entrepreneurship related credits) will develop live projects under the guidance of a supervisor/instructor. This will give students hands-on experience on specific topics.
- **Clickers in class:** Clickers are classroom response systems that consist of hardware and software that aid in teaching activities. Clickers are known to be effective in promoting student engagement, maintain student attention during class, and foster discussions[118].

Summative Assessments:

- **Written exams**: In this type of exam, students are given a range of questions to answer divided into topic sections covered in the course. They expected to give answers within a stipulated time frame in an exam setting. These exams can be a mix of short and long answer, multiple choice and case study based and can be conducted either through open book or closed book. Assessment for apprenticeship will be in alignment with the Apprenticeship Act, 1961 and the Guidelines for Implementation Of "National Apprenticeship Promotion Scheme", (As Per Operational Framework) For Apprenticeship in India (Updated as on 1st October,2019).
- **Practical exams:** Depending on the program, the skill component may be assessed undertaken in alignment with UGC guidelines, NOS assessment guidance or any other approved assessment framework.

While the assessment and evaluation of trainees enrolled in the skill university will be as per the UGC guidelines, however, it is recommended that ASU explores different evaluation for persons with disabilities depending on their disability type. For example, conducting a viva instead of practical exams

[118] https://tophat.com/blog/classroom-clickers/

for the science and technology papers, allowing usage of screen reading software, giving an extra 20 mins per hour to complete their exam, permitting partially blind to use sketch pens to write the answers and use magnifying glass to read question paper, giving alternate questions in places where question mentions drawing of maps, diagrams and geometrical figures, word count of answers can be less than the expected word count. For candidates having deformities, deaf and mute students, blind/partially blind, specific learning disabilities an exam centre close to their homes would be convenient and writer may be provided to the student for writing or typing the answers or for writing some part of the paper or the entire paper.

The proposed grading system may be such that it converts marks obtained into grades on the basis of pre-defined class intervals. The UGC recommends a 10-point grading system which is shown in the table below along with class intervals mapped:

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Table 13: Grades and grade points

Letter Grade	Achievement scale	Grade point	Relative Performance (in %)
O	Outstanding	10	85 – 100
A+	Excellent	9	75 – 84.99
A	Very Good	8	65 – 74.99
B+	Good	7	55 – 64.99
B	Above average	6	50 – 54.99
C	Average	5	45 – 49.99
P	Pass	4	40 – 44.99
F	Fail	0	Less than 40
Ab	Absent	0	-

Note: A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

Computation of SGPA and CGPA

It is suggested that ASU adopts the following procedure while computing the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) of students enrolled in ASU.

SGPA Calculation: It is calculated as a weighted average of the number of credits and the corresponding value of the grade point obtained. The formula used to calculate the GPA for one semester is shown below:

$$SGPA\ (Pj) = \sum (Ci \times Gi) / \sum Ci$$

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- where Ci = number of credits of the ith course component
- Gi = grade point that the student has obtained in the ith course component
- Pj= GPA obtained in semester j

CGPA Calculation: It is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a program. The formula used to calculate the CGPA is shown below:

$$CGPA = \sum(Ci \times Si) / \sum Ci$$

- where Si = number of credits of courses completed by a student
- Si = SGPA of the ith semester
- Ci = total number of credits in that semester

Source: UGC B.Voc. guidelines

It is suggested that both the SGPA and CGPA obtained by students are rounded off to the nearest two decimal places and then be reported in the transcripts. The certification levels will lead to Diploma, Advanced Diploma, or Bachelor of Vocational Education in one or more vocational areas and will be awarded by Assam Skill University.

Assessment for Apprentices

- For apprenticeship integrated in the D.Voc, B.Voc or M.Voc pathway, the assessment mechanism shall be as per the UGC Guidelines for Higher Education Institutions to offer Apprenticeship/Internship embedded Degree Programme. The guidelines stresses that the mechanism should be developed in consultation with the Industry partner or within the ambit of the National Apprenticeship Training Scheme (MHRD).
- For assessments as a Basic Training Provider, ASU can assess the theory component of the training.

Assessment for PhD students

PhD students shall be evaluated based on the UGC outlined norms in the (Minimum Standards and Procedure for Award of M.PHIL./PH.D Degrees) Regulations, 2016. Upon securing grades as required in the regulations, PhD scholars need to produce a draft dissertation in the stipulated time. Students need to be allocated a Supervisor and need to report progress to the Research Advisory Committee. Evaluation of the dissertation will be conducted by external assessors.

4.1.5. Remote Learning Framework and Digital Content

Remote learning is becoming a go-to training method as it enables everyone to pursue training programs/courses without being physically present at training locations. For example, a Massive Open Online Course (MOOC) established in the year 2008 is a web-based platform which brings teachers and students together and provides study/course material and video lectures of the best institutes in the world. ASDM has created the mobile application named DAKSHA (Digital Access to Knowledge and Skilled Human Resource of Assam) envisioned as a multi-faceted app bringing all stakeholders including trainees to a single platform. Remote learning platform is being used aggressively for training purpose under the given pandemic situation.

The pressure to 'go digital' has heightened with the outbreak of COVID-19 pandemic, as digital infrastructure has become essential for almost everything. Technology is helping to ease global disruptions across many if not all sectors of the economy. With lot of uncertainty around student enrolment, changing operating models and the need for virtual learning at scale, the move to online training, which takes less time than in-person efforts and is more cost effective has accelerated and is likely to be the new norm going forward. Since technology has become inevitable part of the workplace, this calls for reskilling of existing employees of SMEs & Start-ups, upskilling of workforce of corporations to use digital tools effectively and fresh skilling of youth on basic & advanced digital skills. ASU can collaborate with corporates/employers to actively support in employees training by digitizing training content/ modules through its remote learning platform. In addition to its students and corporates, ASUs learning platform can be made accessible to external candidates for pursuing various online courses/programs.

Additionally, ASU may run short (non-B. Voc aligned) online programs in collaboration with ASDM or other skill training providers, or industry players. In order to run UGC aligned online diploma or degree programs, the exhibit below details out the eligibility criteria that any higher educational institution, must fulfil for offering such programs:

Figure 21: Proposed eligibility criteria for offering online courses

(1.) The Institution should have been in existence for at least five years

- Should be accredited by the National Assessment and Accreditation Council (NAAC) with minimum score of 3.26 on a 4-point scale; and
- should be in the Top-100 in overall category in the National Institutional Ranking Framework (NIRF) for at least two years during the previous three years:
- Provided that items (ii) and (iii) shall not be applicable to government Open University till National Assessment and Accreditation Council (NAAC) or similar accreditation system and National Institutional Ranking Framework (NIRF) are made available for such Open University.

(2.) An Higher Educational Institution shall offer Online Course or Programme in only those disciplines in which it has already been offering the same or similar Course or Programme in regular mode (of classroom teaching) or in Open and Distance Learning mode and from which at least one batch has been passed out:

- Provided that the Online Course or Programme requiring Practical or laboratory courses as a curricular requirement shall not be conducted.

(3) An Higher Educational Institution may offer Certificate, Diploma and Degree Courses or Programmes in full-fledged online mode subject to the condition that all such Courses or Programmes are duly approved by the statutory authorities or bodies of the Higher Educational Institution and the delivery mechanism conforms to the quality standards of the Online education as specified under these regulations.

(4) An Higher Educational Institution should have the demonstrated capability for developing and production of Online Courses or Programmes-

- by in-house faculty for designing courses of the Course or Programme and developing the same in a manner that can impart skills and knowledge;
- with the technology for production including in-house or duly out-sourced production facilities for converting the courses of a Course or Programme into Online Courses or Programmes in the following minimum four quadrants, namely:–
  - learning videos with recording or dubbing or editing facilities for graphics or animation creation;
  - e-content for reading and improving comprehension of learners;
  - tests and assignments that test the understanding; and
  - discussion forum that clarifies the doubts of the learners;

- SWAYAM access is required for-
  - Learner Authentication - integrated with AADHAAR or other government recognised identity for Indian students and Passport for foreign students;
  - Learner Registration - through a web application with supporting documents;
  - Payment Gateway –using Digital Payment system;
  - Learning Management System - which tracks the delivery of a Course or Programme, learner's engagement, assessment, results, and reporting supported by analytical tools that can help the teachers to extract and use the relevant reports;
  - with ability to conduct examinations either using technology-enabled online test with all the security arrangements ensuring transparency and credibility of the examinations, or through the Proctored Examination.

Source: UGC Regulations for online courses 2018 (https://www.ugc.ac.in/pdfnews/7553683_Online-Courses-or-ProgrammesRegulations_2018.pdf)

In order to develop online education delivery capabilities, ASU can consider having ICT and blended form of education from the very beginning for seamless trainee experience. A comprehensive Learning Management System designed to identify training and learning gaps, utilizing analytical data and reporting, would be a key platform for online content, including courses and delivering and managing all types of content, including video, courses, and documents. Learning management solution will help to cater all needs around trainings that will be imparted in ASU such as – Training plan, calendars, circulars, attendance, live classes, digital content etc.

LMS shall enable the Skill University to adopt a hybrid learning model combining physical hands-on experience 24*7 ad hoc self -earning. The exhibit below establishes the rationale for having an LMS in place and its key advantages.

Figure 22: Rationale for having LMS in ASU

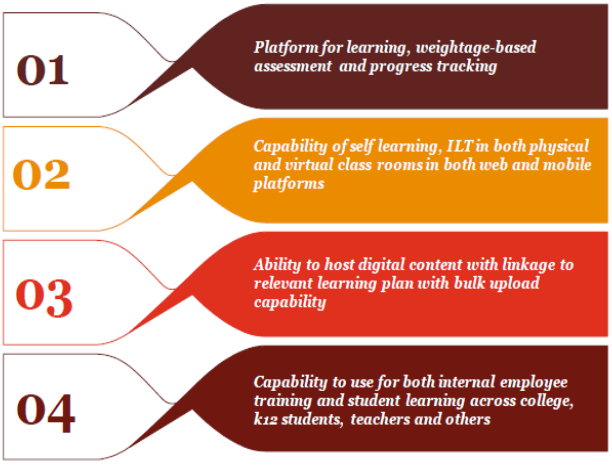
LMS as a solution for remote learning and hosting varied content for the learners shall have following features:

- Platform for learning, weightage-based assessment and progress tracking
- Capability of self-learning, ILT in both physical and virtual classrooms in both web and mobile platforms
- Ability to host digital content with linkage to relevant learning plan with bulk upload capability
- Capability to use for both internal employee training and student learning across college, k12 students, teachers and others
- Certification and Calendar and Scheduling
- Interactive dashboards and reporting
- Project and Assignments

Some additional pointers to be considered for the system can be:

- Cloud compatible solution easily accessible over internet.
- Learning content security and accessibility based on security configured.
- Scalable LMS platform for increasing users and learning content.
- Easy linkage between learning plans and trainings.
- Bulk upload facility for uploading learning plans.
- Compatible to all major browsers and compatible with mobile browsers.

Figure 23: Additional features of LMS



Thus, LMS will provide students holistic learning by delivering course online and in blended form. The

Figure 24: Recommended approach for operationalizing the LMS

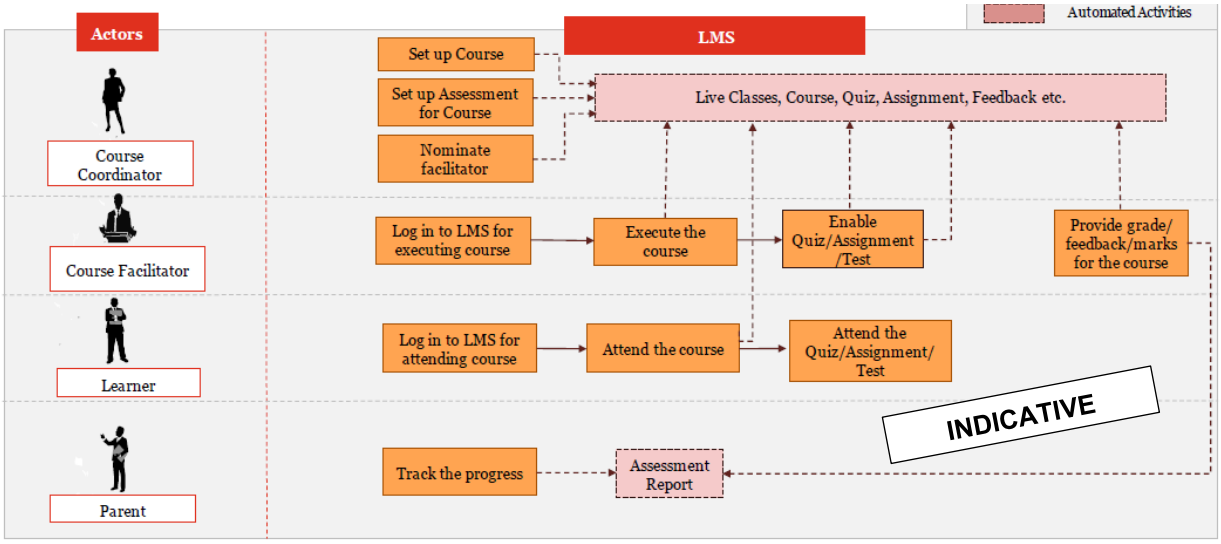


exhibit below gives an overview of the approach which can be adopted for operationalizing a comprehensive digital learning solution/LMS for the skill university:

In addition, some innovative teaching strategies can be adopted by the trainers/faculty by leveraging the LMS and technology to make their teaching way more interesting. To help students experience a deeper level of engagement and understanding, the course content can be made interactive and visual through use of smart boards. Interestingly, the concept of 'Flipping the classroom' teaching method is becoming increasingly popular where the onus of learning is passed onto the students. Teachers act as resource providers and the students take the responsibility of gathering concepts information. Students are encouraged to constructing knowledge, fill in the information gaps and make inferences on their own. Other effective teaching strategies involve imparting education and training through virtual reality, 3D printing technology and cloud computing. Considering that technology offers an endless set of resources for teaching, ASU can tap into such effective technology-based methodologies depending on the needs of the students.

4.1.6. Inclusive Learning at ASU

ASU as a university is recommended to strive towards an inclusive educational environment, attract, retain and develop a diverse student and staff community and ensure that campus is inclusive and accessible for everyone to achieve their full potential. ASU campus can be inclusive to promote technical education amongst women in the state and region and the backward communities. By promoting a culture of equality, diversity and inclusion, ASU shall seek to develop further as a learning organisation and as the best possible place to work and study. The proposed inclusion framework shown in the below exhibit outlines ASU's focus on creating an environment that promotes gender equality and inclusion of the socially vulnerable by mapping the aspirations, principles and goals. It lays stress on women, tribal communities, backward communities and specially abled students and teachers.

Figure 25: Proposed Inclusive learning framework at ASU

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Aspirations

Creating a vibrant, creative, supportive, inclusive learning and work environment where everyone feels respected, valued and that encourages the recruitment, development and retention of a diverse pool of talented staff/faculty and students.

Principles

- To commit to inclusion as a fundamental part of overall strategy
- Adherence of basic rights and ensuring equal opportunities for all
- Focus will be to recognise and address systematic disadvantage
- Non- discrimination on the basis of race, creed, sex, social status or family origin
- Participation in policy, governance and strategy
- Focus on the most vulnerable through targeted strategies
- Accountability through targeted results

Goals

Access

Determine effective and targeted plans and initiatives to attract & recruit a diverse community of staff and students through targeted information and outreach strategies and opportunity centered around broadening the options to include all. The infrastructure of ASU shall be accessible to PWDs.

Participation

Create an environment where they engage in the decision making and management, learning and overall development process. This will require the development of a broad range of plans and actions to ensure that all staff and students can successfully participate in university life.

Retention & Development

Retaining talented students and staff who have the opportunity and support to succeed in their own areas of strength or endeavour.

People within community will be accepted for their unique qualities & will be empowered to access opportunities available to them.

Transition to sustainable development

Adopt inclusive strategies for facilitating placement and entrepreneurship opportunities by including industry and the larger community. Some strategies include additional counselling sessions, industry exposure visits, success stories, and family motivation.

Focus for staff

- Staff with disabilities
- Staff belonging to marginalized communities/minority/tribal groups
- Staff working in professions or disciplines where there are significant gender disparities
- Women staff, especially academic women
- Non discrimination due to sexual preferences

Focus for students

- Students with disabilities
- Students belonging to marginalized communities/minority/tribal groups
- Students studying in disciplines where there are significant gender disparities and/or where there are issues of gender equity
- Students from low socio-economic background
- Non discrimination due to sexual preferences

Based on the above defined inclusive learning framework, it can be concluded that understanding and anticipating the diverse needs of the community (local, national and global) and students will be of paramount importance. Further, it is suggested that the university campus should have buildings with consideration of the way in which they will be used by everyone with the overall objective of delivering a user experience which supports all users equally. In addition, ASU can consider implementing course design and development principles which foster inclusive curricula, and which respect the need for its students to see themselves, their lives and their backgrounds in their learning experiences. This can be achieved by creating opportunities for staff and students to co-create their course resources, content and learning materials by sharing their knowledge and experiences.

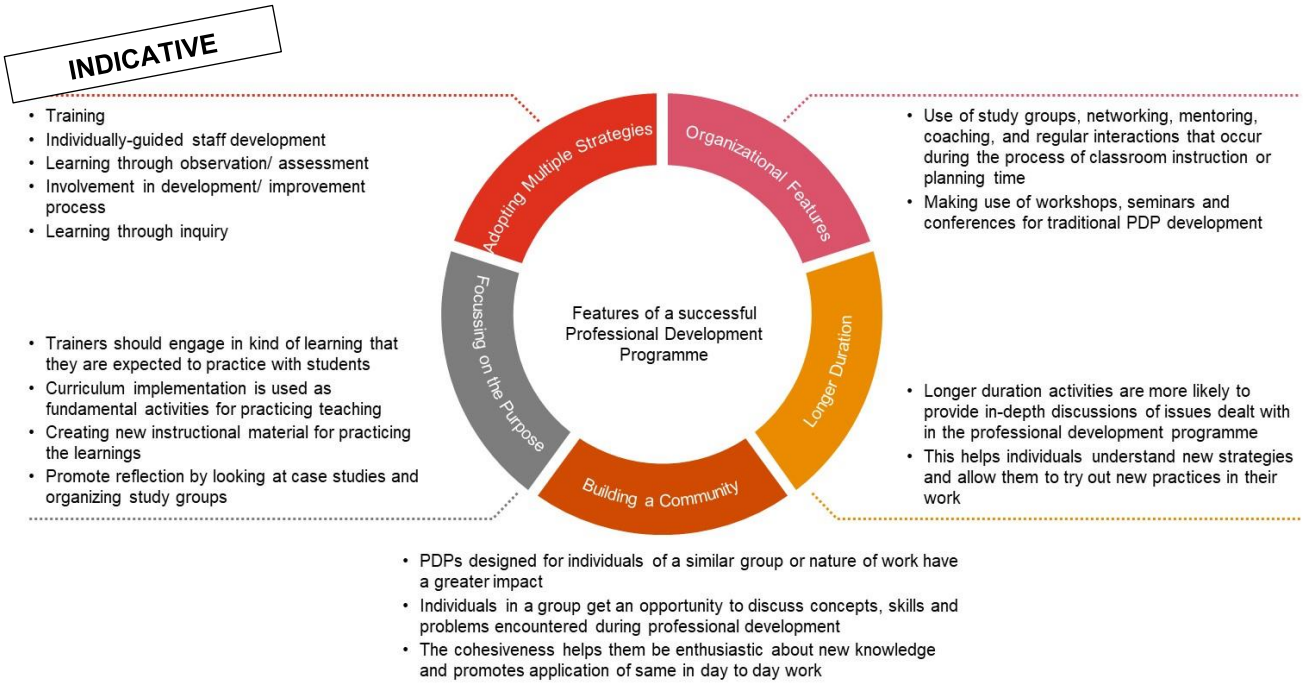
Thus, it is recommended that equality, diversity and inclusion should form the foundation stone of ASU and this in turn will be integral to ASU's culture and at the core of how it will work with all members of the community.

4.2. TVET Teachers' Training Model

Trainers/Teachers are nodal to the successful and quality training delivery. The Skills policy and NEP frameworks emphasis the need for adequate capacity building of instructors. There is a shortage of high quality TVET trainers. There is also lack of focus on professional development of trainers with a clear career path. Further, most of the trainers are traditionally not trained to impart NSQF aligned skill training across various job roles.

Professional Development Plans are an integral part of capacity building of any individual and are about improving an individual's learning and achievement and building capacity to learn. It is a way of making an individual an active participant in the learning process, empowering them to be independent learners and motivating them to achieve their full potential.

Figure 26: Features of the proposed Professional Development Program at ASU



There are several TVET Teacher development programs that exist (attached in the annexure). Presently, most of the Training of Trainers (ToT) programs conducted by SSCs are spread across 5-6 days only, under which an overview of model curriculum and basic pedagogy is imparted, leading to

learning at elementary level. Therefore, ramping up the quality of trainers through regular training, interactions with the industry and use of new technologies would be critical for ASU.

Center for Faculty and Curriculum Development

All TVET trainer capacity building interventions can be anchored by the Center for Faculty and Curriculum Development in Coordination with the Human Resources and Academic Department. In addition to training in-house trainers, the Center for Faculty and Curriculum Development can be established to innovate with curriculum and help address the shortage of quality trainers in the TVET system. It shall offer training of trainers to enhance the pedagogical and technical competencies and leadership skills of TVET trainers, provide services in curriculum designs and development, and deliver learning resources and materials.

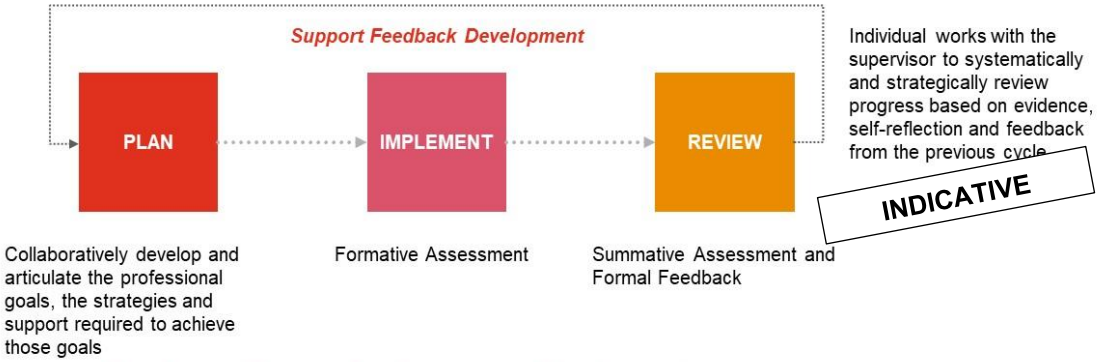
TVET trainer capacity building interventions at ASU is recommended to be across 2 broad areas, these are:

1. **Professional Development Plans for TVET trainers:**

   In addition to the renewed Faculty Induction Program (as envisaged in the Draft UGC Guidelines on Induction and Mentorship for Teachers of Higher Education)[119], ASU trainers/teachers can be encouraged to undergo this holistic program for overall professional development.

   Firstly, teachers can be engaged through a workshop and one on one sessions to enable them to understand the usefulness of the program and reflect on their own abilities with the support of supervisors. This will help develop customized and accurate PDP plans for each trainer.

Figure 27: Recommended approach for TVET trainers development



Key phases of the annual performance and development process

The end result of this step would be finalised PDPs that can be approved by the Head of Academics with appropriate feedback and assessment mechanisms. Concurrent formative and summative assessment methodologies can be used to assess an individual's progress during the entire annual development cycle holistically.

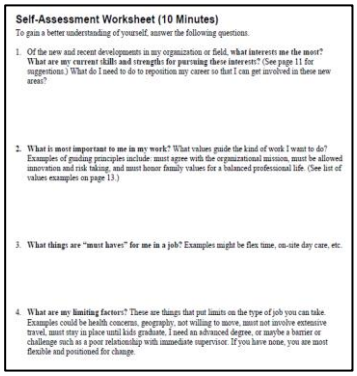
The help create the PDPs, TVET teachers at ASU can be categorized as per the sector of training and their years of work experience (such as Category A- more than 10 year; Category B- 5 to 10 years and; Category C- Less than 5 years). Their scale of qualifications and understanding can be captured in the 'Professional Development History Worksheet' (template attached in the annexure). This template will ensure that TVET teachers are categorised appropriately. Each cohort can have different professional development needs and therefore a need-based approach can be followed for deriving tailored solutions.

Once categorized, teachers would undergo a rigorous program comprising:

[119] It is mandatory for every newly appointed teacher to attend induction programme within one year of his/her appointment prior to his or her regularization/confirmation.

- Self-reflection activities
- soft skills trainings
- focus on relevant pedagogies
- exposure visits to the industry (depending on their sectors)
- Exchange programs and training programs to other TVET institutions

Additionally, individual goal setting workshops can be conducted. The individual goals would consider the current job responsibilities, organizational improvement plan; content needs and own aspirations for future.



Self-Assessment Worksheet (10 Minutes)

To gain a better understanding of yourself, answer the following questions.

1. Of the new and recent developments in my organization or field, **what interests me the most? What are my current skills and strengths for pursuing these interests?** (See page 11 for suggestions.) What do I need to do to reposition my career so that I can get involved in these new areas?

2. **What is most important to me in my work?** What values guide the kind of work I want to do? Examples of guiding principles include: must agree with the organizational mission, must be allowed innovation and risk taking, and must honor family values for a balanced professional life. (See list of values examples on page 13.)

3. **What things are "must haves" for me in a job?** Examples might be flex time, on-site day care, etc.

4. **What are my limiting factors?** These are things that put limits on the type of job you can take. Examples could be health concerns, geography, not willing to move, must not involve extensive travel, must stay in place until kids graduate, I need an advanced degree, or maybe a barrier or challenge such as a poor relationship with immediate supervisor. If you have none, you are most flexible and positioned for change.

This activity would start with defining professional and personal goals and undertaking a self-assessment to have alignment with organizational goals. A sample self-assessment worksheet (has been attached in the annexure) is given here to understand the kind of questions that an individual will be answering during goal setting. Every individual will list the skills required to achieve their respective goals.

The final output of goal setting activity is illustrated below:

Goals	Activities To meet Goals	Skill Sets Required
Short Term: 1. 2.		
Long Term: 1. 2.		

Once the Professional Development Plans have been developed, TVET teachers can be evaluated on an ongoing basis until the end of the academic cycle based on different methodologies. This shall involve focus on continuous improvement of teaching, learning and leadership practice and the learning outcomes for students. Reflective practice and feedback allows for adjustments and refinements to be made to the PDP as the annual cycle progresses.

These are:

- **Improving teaching by examining student learning:** This approach enables faculty to determine what students know and can do as a result of their instruction
- **Formative evaluation by students:** Helpful and regular feedback from students will help in mid-course correction for teachers and ITI administration
- **Repeated Measurements of Student Learning:** End-of-course student evaluation is a form of an indirect assessment tool that can be used for teacher assessment
- **Evaluation of performance during prescribed trainings:** Evaluation of performance during classroom and self-paced training will support in assessment of ITI staff
- **Formative assessment by teaching assistants and colleagues:** Teaching assistants and colleagues are involved in formal feedback process and gives an in-depth perspective on performance

The Professional Development Program shall aim to work in alignment with UGC once the draft guidelines are notified.

2. Teacher mentoring:

Mentoring has long been recognized as a powerful tool in career development. The UGC Draft Guidelines for Induction and Mentorship for Teachers of Higher Education, 2021 envisage

mentoring is a key strategy of induction. Therefore, in alignment with this, ASU can facilitate not only mentoring of new teachers but also for those with experience, enabling them to benefit from senior teachers, industry and other SME mentors.

3. Technical training programs for TVET trainers:

ASU trainers can also undergo technical trainings in their areas of specialisation. Regular TOT workshops can be conducted in collaboration with relevant SSCs, industry partners, other institutes such as the National Mission on Teachers and Teaching, NITTR, Indian Society for Training & Development (ISTD), Sector Skill Council TOT programs, etc. International collaborations can also be forged for exchange programs, online TOT opportunities so that the trainers are equipped with the best possible skills for training ASU students such as with TAFE, ITE Singapore, etc.

The National Mission for Teacher and Teaching

The National Mission for Teacher and Teaching hosts several teacher development programs under the larger ambit of the Pandit Madan Mohan Malaviya National Mission on Teachers & Teaching Scheme. The Mission addresses comprehensively all issues related to teachers, teaching, teacher preparation, professional development, curriculum design, designing and developing assessment & evaluation methodology, research in pedagogy and developing effective pedagogy. The Mission runs programs through several types of centers these are:

- Schools of Education in Central, State and Deemed Universities (SoE)
- Centres of Excellence for Curriculum and Pedagogy
- Centres of Excellence in Science and Mathematics Education (CESME)
- Teaching Learning Centres (TLC)
- Faculty Development Centres (FDC) (20 Nos.)
- Inter-University Centre for Teachers Education (IUCTE)
- National Resource Centre for Education (NRCE) (1 Nos.) V. Centres of Academic Leadership and Education Management (CALEM)
- Innovations, Awards and Teaching Resource Grant, including workshops and seminars (IATRG)
- Subject Networks for Curricular Renewal and Reforms(SBN)
- Leadership Development for senior functionaries in higher education institutions
- Induction training of newly recruited faculty
- National Resource Center
- Leadership for Academic Programme

The state of Assam currently has 7 such centres

Host Institute	Program
Assam University, Silchar, Assam	• Faculty Induction Program • Schools of Education in Central, State and Deemed Universities
IIT Guwahati, Guwahati, Assam	• Centre Of Excellence In Curriculum And Pedagogy
National Institute of Technology (NIT), Silchar, Assam	• Innovations, Awards and Teaching Resource Grant, including workshops and seminars
Tezpur University, Tezpur, Assam	• Faculty Induction Program • Centre Of Excellence In Curriculum And Pedagogy • Teacher Learning Center

ASU can collaborate with the Assam based centers to run aspects of its teacher and faculty development programs. Additionally, ASU a few years down the line may apply to host permitted centers for teacher learning such as:

- **Schools of Education**
- **Centres of Excellence in Teaching and Learning Development**
- **Inter-University Centres for Teacher Education**

Source: https://nmtt.gov.in/

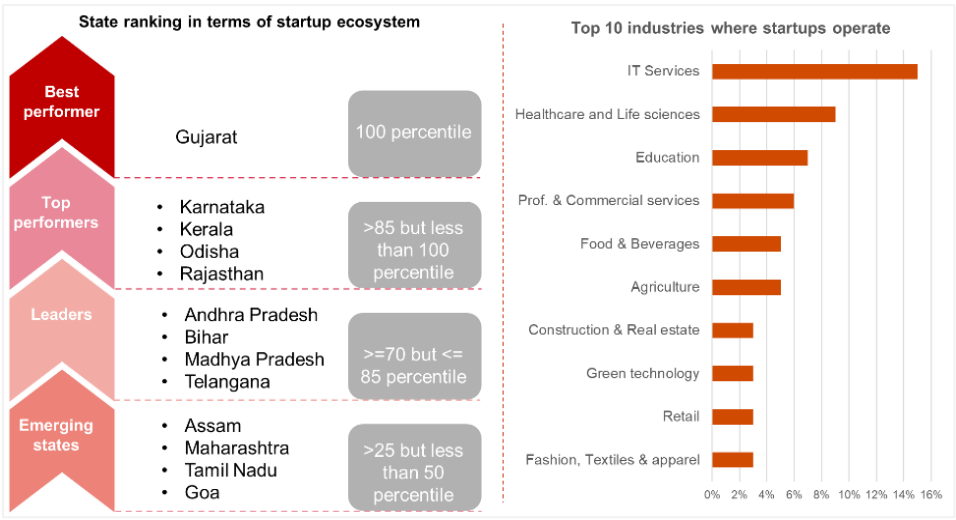
4.3. Research and Development and Innovation Strategy

Universities play a vital role in supporting business and communities, promoting local and national economic growth and innovation, and supplying highly skilled and employable graduates. The Indian government launched the Startup India initiative in the year 2016 to nurture a strong ecosystem of innovation and entrepreneurship in the country with the vision of making India a country of job creators instead of job seekers. Reviewing the current R&D, innovation and Startup practices and initiatives in the state of Assam vis-à-vis best performing states will be of paramount importance as this will help assess Assam's performance across these aspects, issues/challenges faced by the innovation and Startup ecosystem, draw learnings and replicate models of two better performing states so that it can become a fast growing hub of businesses.

India being the 3rd largest Startup ecosystem in the world is home to Start-ups working in industries ranging from Fintech to Food-tech and Robotics to Agri-Tech[120]. Further, the Department of Industrial Policy and Promotion (DIPP) has devised a States Startup Ranking Framework which ranks states and union territories in the country across seven pillars which include Startup policy and implementation, incubation support, seed funding, angel and venture funding, simplification of regulations, easing public procurement and awareness and outreach.

The figure on the right provides an overview/ranking of some of the better performing states for the year 2018 and the top 10 industries where start-ups operate in the country. It can be noted that the states of Gujarat, Karnataka, Kerala, Odisha and Rajasthan have done significantly well in the State Startup ranking exercise 2018. Assam has been acknowledged as an 'Emerging State' performing relatively well in 2 pillars namely 'Startup Policy and Implementation' and 'Simplified Regulations' as compared to national average[121]. Further, to promote innovation and entrepreneurship, the state launched its Startup policy in 2017 with the objective of facilitating at least 1000 new start-ups across all sectors over the next 5 years and attract funding opportunities of $250 million for state-based Start-ups and incubators. Assam supported marquee incubator 'Assam Business Incubation Hub' in Guwahati and organized 9 bootcamps in various education institutes to foster innovation among students[122].

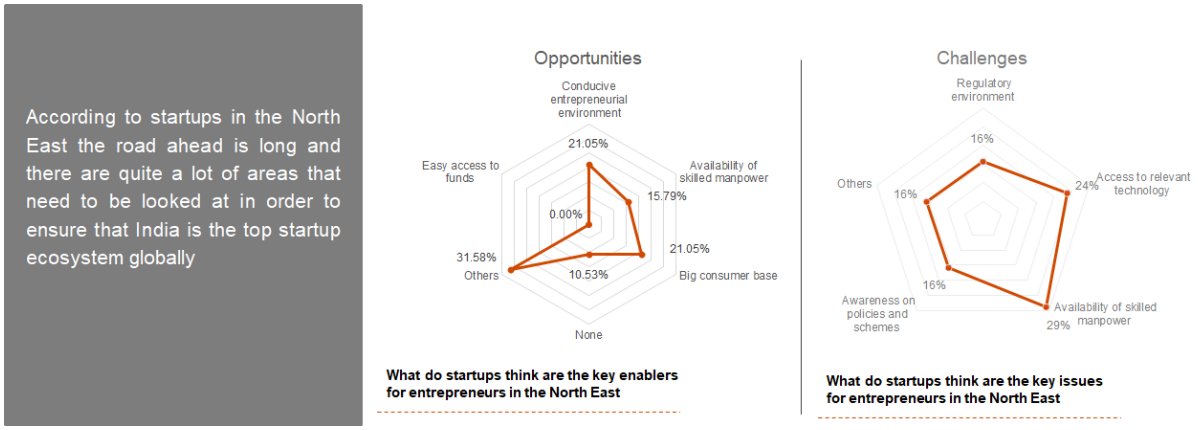
Figure 28: State wise Startup ranking and industries having maximum startups



Source: State's Startup Ranking 2018

[120] https://www.businesstoday.in/current/economy-politics/india-3rd-largest-startup-ecosystem-home-to-21-unicorns-ambassador-to-us/story/427132.html
[121] States Startup Ranking 2019
[122] https://startup.assam.gov.in/

Figure 29: Startup's perception of the North East as an ecosystem



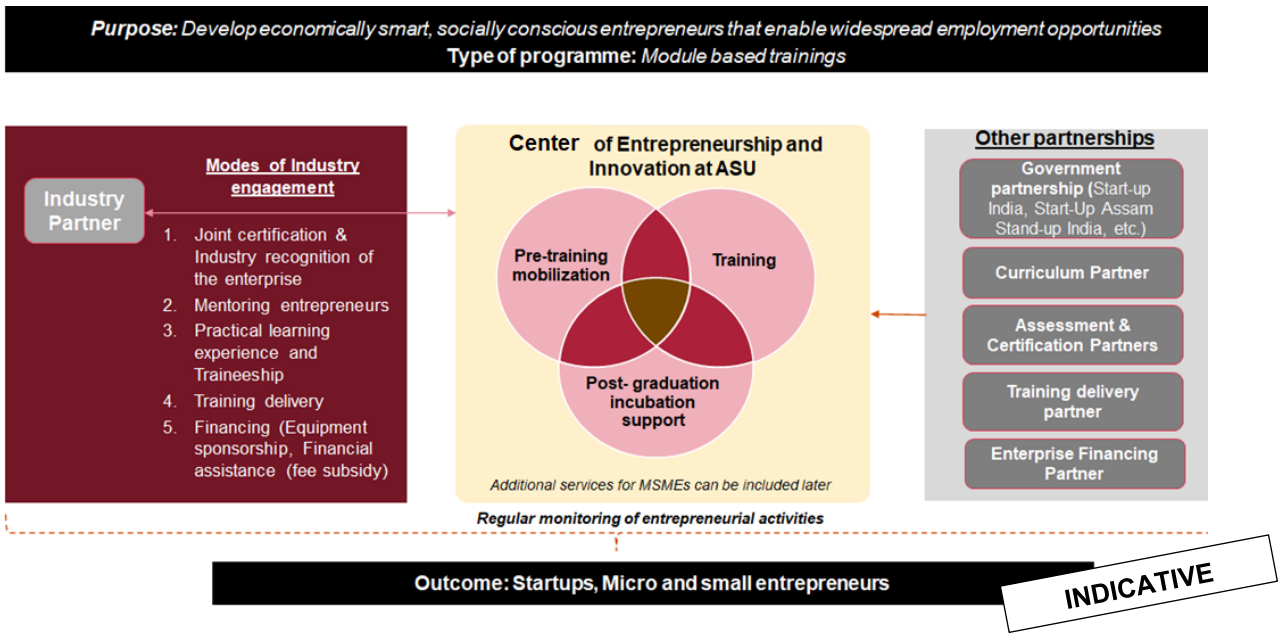
Source: Study team Analysis

In this context, applied R&D models, innovation and Startup practices would be implemented in true spirit of the Skills policy at ASU. Some of the key initiatives that ASU can consider undertaking are:

1. Center for Entrepreneurship and Innovation

The center may focus on promoting entrepreneurship and technology innovation opportunities for trainees and others in the state by providing entrepreneurship training, mentoring, support for business incubations, and facilitation for market linkage and financing. The school will also focus on cluster based micro-entrepreneurship, small and medium business and technology start-ups. The school will provide an integrated quality support system in collaboration with reputable national and international institutes.

Figure 30: Proposed Entrepreneurship and Incubation Model



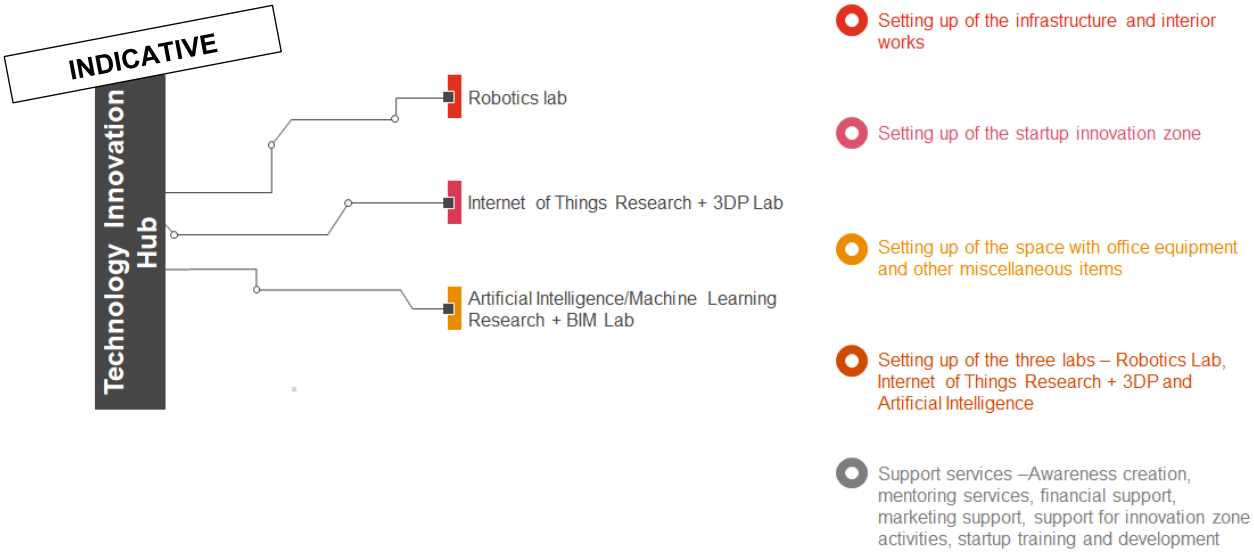
Key activities of the center in addition to entrepreneurship training may include:

- Adopt a module-based learning approach and run several entrepreneurship related programs and capsule courses
- Conduct short events on campus to encourage students to participate in entrepreneurship and innovation programs
- Conduct regular business plan and innovation challenges/competitions
- Conduct state level hackathons
- Establish a Makers Lab

- Provide incubation services such as access to co-working infrastructure, mentorship, networking, market linkages, mediation services, equipment (makers labs, hi-tech equipment), funding (connect with venture capitalists, donors, schemes, etc.), generic services such as legal, IPR, etc. to incubatee start-ups
- Run awareness generation sessions and workshops for other TVET institutions in Assam (such as ITI), higher education institutions, schools, etc.
- Conduct webinars/events/conferences on entrepreneurship and innovation promotion
- Link with donors and major govt. schemes
- Assam also has a Startup portal which will be leveraged to provide services such as learning and development, mentor and investor connect, incubation and innovation support, concreted efforts are required to improve the state's ranking as also highlighted in the state's ranking report 2018
- Offer incubation services in a few years

The centre may also house a technology innovation hub. The Hub can work in collaboration with the School of Technology and the School of Manufacturing and Construction. Key interventions may be:

Figure 31: Interventions proposed in the technology innovation hub



2. Skills Research and Development Hub

The Hub may provide various skill-related research and services, including updated Labor market information on skills demands, emerging skills training programs, career guidance and TVET training information, among others. The Hub will be responsible for collecting, managing, analysing, evaluating and communicating research and statistics about TVET in the state of Assam. It will help promote better understanding and discussion within the TVET sector and assist policymakers, practitioners, industry, training providers, and students to make informed decisions. The Hub's vision would be to inform and influence vocational education and training in Assam through credible, reliable and responsive research and statistical services. Its mission will be to become an authoritative source of high-quality independent information on TVET.

4.4. Student Mobilization and Admission Strategy

The Skill University can consider attracting students from a variety of backgrounds and geographical regions with key focus on women, students with disabilities and from backward communities, especially tribal belts to promote inclusive learning. Thus, there shall be the need for a streamlined approach from awareness generation to final enrolment of abovementioned student segment so as to mobilize genuine talent not only from Assam but across the country (especially the north eastern part) and some neighbouring countries as well such as Nepal, Bhutan, Bangladesh, etc. Consequently, the approach has been divided into two phases:

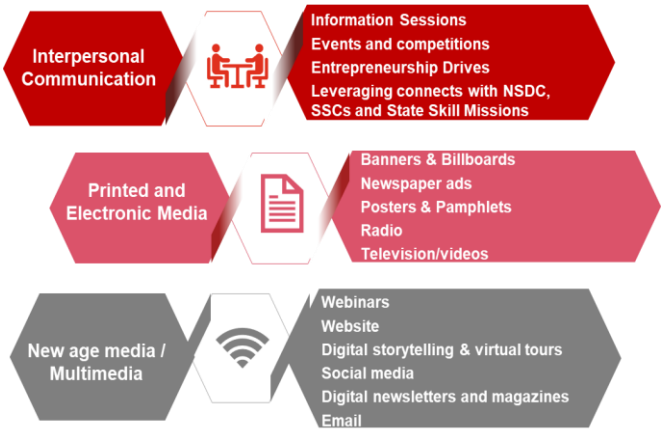
- Pre-Selection: IEC and Mobilization
- Selection: Admission Test/ Screening/ Pre-Assessment, Counselling and Enrolment

It is recommended that ASU's mobilization strategy focuses on socio, cultural, normative issues in choice of courses, motivation and aspiration vis-a vis aptitude and interest. The suggested strategies have been developed based on several best practices around the globe and have been contextualized in the local context based on the different training programs/courses envisaged at ASU.

Pre-Selection Strategies

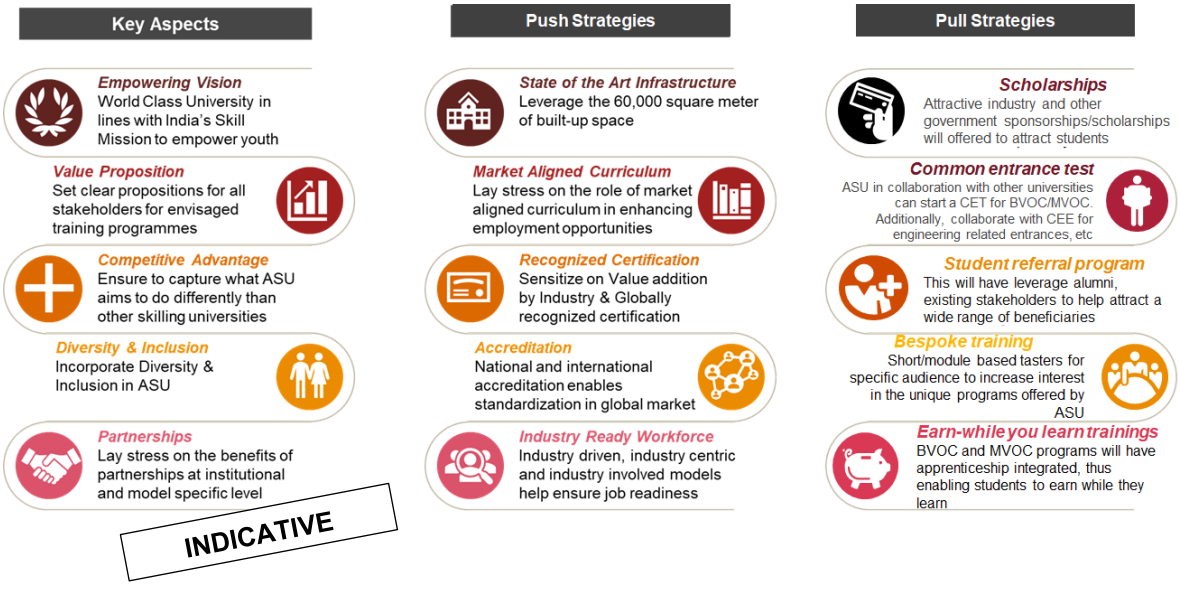
The Pre-selection strategies shall be a combination of 'pull' and 'push based strategies. These strategies capture the process from awareness creation to generating willingness among the candidate to enrol. Harmonized integration of 'IEC and Mobilization' are critical to improve the reputation and attraction towards the skill university. Consequently, it is important to explore an exhaustive list of tools for an effective IEC to enable successful mobilization. The various tools referred are demonstrated in the adjacent exhibit.

Figure 32: List of tools for effective IEC (INDICATIVE)



The following key 'Aspects and Push and Pull strategies' will be critical in devising the IEC plan:

Figure 33: Key 'Push' and 'Pull' Strategies



The table below summarizes the Pre-Selection strategies suggested for the different student target segment envisaged at ASU.

Table 14: Pre-selection strategies for the student target group (suggestive)

Potential Target Group	Suggested strategies for mobilization
School dropouts	• Regional Newspaper and Radio ads • Advertising admissions and programmes in English and other regional languages • Community meetings & job fairs • Social Media platforms of ASU, Entertainment apps, OTT platforms • Organising campus tours (for students residing near the ASU campus) • Develop brochures and pamphlets • Participate in Career Fairs across the country • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos
Class 10th pass outs	• Information Sessions in schools & training centres under State Skill Mission • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Social Media platforms of ASU, Entertainment apps, OTT platforms • Newspaper and Radio ads • Develop brochures and pamphlets • Organize campus tours (for students residing near the ASU campus) • Publish Quarterly Newsletters in website and skill forums • Participate in Career Fairs across the country • Organise 'Skill Fests' • Community meetings & job fairs • For mobilizing in remote/underserved areas- in collaboration with ASDM and relevant DM's, ASU should conduct 'Information sessions' in select local schools or the DM office
Class 12th pass outs	• School Connect Programs • Exposure visits to campus and industries • Information Sessions in schools & training centres under State Skill Mission • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Social Media platforms of ASU, Entertainment apps, OTT platforms • Newspaper and Radio ads • Develop brochures and pamphlets • Publish Quarterly Newsletters in website and skill forums • Participate in Career Fairs across the country • Organise 'Skill Fests' • Organize campus tours (for students residing near the ASU campus) • Community meetings & job fairs • Advertisement in job sections of newspapers and online job portals • For mobilizing in remote/underserved areas- in collaboration with ASDM and relevant DM's, ASU should conduct 'Information sessions' in select local schools or the DM office • Webinars and podcasts inviting experts of reputed firms
Skill trained youth	• Advertisement in job sections of newspapers and online job portals • Information Sessions in training centres under State Skill Missions • ASU's website, Social Media platforms of ASU and Radio • Advertisement in Online Learning websites • Webinars and podcasts inviting experts of reputed firms • Publish Quarterly Newsletters in website and skill forums

Potential Target Group	Suggested strategies for mobilization
	• Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Organising campus tours (for students residing near the ASU campus) • Develop brochures and pamphlets • Participate in Career Fairs across the country
ITI graduates	• Information Sessions in ITIs • Advertisement in job sections of newspapers and online job portals • ASU's website, Social Media platforms of ASU and Radio • Advertisement in Online Learning websites • Webinars and podcasts inviting experts of reputed firms • Publish Quarterly Newsletters in website and skill forums • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Organising campus tours (for students residing near the ASU campus) • Develop brochures and pamphlets • Participate in Career Fairs across the country
Polytechnic graduates	• Information Sessions in polytechnics • Advertisement in job sections of newspapers and online job portals • ASU's website, Social Media platforms of ASU and Radio • Advertisement in Online Learning websites • Webinars and podcasts inviting experts of reputed firms • Publish Quarterly Newsletters in website and skill forums • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Organising campus tours (for students residing near the ASU campus) • Develop brochures and pamphlets • Participate in Career Fairs across the country
Bachelor's and Master's graduates	• Information Sessions in colleges and universities • Advertisement in job sections of newspapers and online job portals • ASU's website, Social Media platforms of ASU • Advertisement in Online Learning websites • Webinars and podcasts inviting experts of reputed firms • Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos • Organising campus tours (for students residing near the ASU campus) • Develop brochures and pamphlets • Organise seminars and several open houses

Entrepreneurs- aspiring and existing	• ASU trainees:
	  ○ Awareness kiosks/desks/events on campus
	  ○ Competitions to identify new business ideas
	  ○ Administer an Aptitude test
	• External applicants:
	  ○ Awareness events at identified school as well as ITI, college campuses
	  ○ Publicity in ASU's website, Social Media platforms of ASU and advertisement in Radio ads
	  ○ Webinars and podcasts inviting prominent entrepreneurs
	  ○ Competitions to identify new business ideas
	  ○ Administer an Aptitude test
	  ○ Interview of the potential trainees
	• Existing entrepreneurs:
	  ○ Publicity in ASU's website, Social Media platforms of ASU and advertisement in Radio ads
	  ○ Inform owners of what services it offers and entrepreneurs entrepreneurship.

Potential Target Group	Suggested strategies for mobilization
	○ Discussion on business ideas, schemes and incentives offered by different agencies. ○ Organise awareness programmes often in interior rural areas to reach out to larger number of women ○ Webinars and podcasts inviting prominent entrepreneurs
Employed applicants	• Advertisement in job sections of newspapers and online job portals • Publicity in ASU's website • Advertisement in Online Learning websites and Industry Tabloids • Social Media platforms of ASU and Radio ads • Webinars and podcasts inviting experts of companies • Publish Quarterly Newsletters in website and skill forums

Mobilizing international students- potential strategies

Assam Skill University shall target mobilizing students from neighbouring countries like Nepal, Bhutan, Bangladesh, etc. owing to its strategic location and proximity to these countries. Below is a list of some strategies which can be adopted for bringing international to ASU campus:

- Website and social media advertising (can be improved with the use of SEO/SMO integration, google analytics)
- Publicity on ASU's website – Training differentiators, virtual tours, testimonials and "life on campus" videos
- Participate in international education student fairs and WorldSkills Competitions
- Facilitate student exchange programs
- Extend support to prospective students in their study visa processing
- One- on-One virtual student connect programme- current students or alumni can be connected with interested prospective students to learn about ASU
- Develop student testimonial campaign which would broadcast stories through web and social media

Mobilizing women, students with disabilities and from backward communities, especially tribal belts- Potential strategies

- Collaborate with Skill Council for Persons with Disabilities (SCPwD) for mobilizing PWD candidates
- For mobilizing in remote/underserved areas- in collaboration with ASDM and relevant DM's, ASU should conduct 'Information sessions' in select local schools or the DM office
- Utilization of community theatre: involving the target group in the design and performance of the play
- Other community communications channels such as radio, regional newspapers, etc.
- Publish stories on women, PWD, tribal and marginalized communities trainees on ASU's website, posters, banners, seminars/workshops, community interactions.

Suggested Roles and Responsibilities of Stakeholders

Clear delegation of responsibilities to stakeholders is critical for the implementation of various Pre-Selection activities. The same is presented in the table below:

Table 15: Roles and responsibilities of stakeholders

Stakeholder	Potential Responsibilities
ASU	• Finalization of mobilization strategy and plan • Setting up mobilization and IEC team • Finalization of eligibility criteria, value proposition and target segments for each program offering • Implementing mobilization and IEC plan • Lead and communication management
Implementing Partners	• Support in finalization of eligibility criteria, value proposition and target segments for each program offering • Support in mobilization and IEC by marketing program offerings in their network institutes/ area of influence

INDICATIVE

In addition to the abovementioned mobilization and outreach strategies, ASU can also consider the pool of candidates registered with Assam Combined Entrance Examination who can be prospective students for the university especially for engineering related trades/occupations. These strategies capture the process of onboarding candidates who have shown interest to enrol in several programs to be offered at ASU. Certain differences in the training models such as duration of the program, target segment, intended outcomes, industry engagement, test modalities, and role of counselling establish the need to adopt different approaches for selecting prospective trainees.

Figure 34: Best practices considered for developing the mobilization strategy

- **Centurion University:** Qualification specific online admission test at dedicated centres in Odisha.
  - Counselling for candidates to make an informed choice on course preference
  - Allotment of course based on merit list, course preferences and seat availability
- **Bhartiya Skill Development University:** Both offline and online common admission tests
  - Course preference submitted at the time of application submission
  - Allotment based purely on merit of the examination
- **Narsee Monjee Institute of Management Studies (NMIMS):** Personal desktop based remote proctored online common admission test
  - Single merit list based on score in admission test, case discussion, PI and work experience
  - Course allotment based on preference, availability of seats and merit list
- **Mettl's Occupational Orientation Profiler:** Psychometric tool encompassing: personality, job-type interest, cognitive abilities and industry preferences
  - Objective to facilitate youth in taking informed decisions that would help them choose right profession for ensuring 'Sustainable Employment'
  - 5-minute assessment matches candidate's personality with the nature of the job roles in the vocational segment
- **TeamLease Skills University**
  - On demand and subscription-based classroom and virtual trainings on Technical, Soft skills, Leadership & Executive Coaching to corporate clients
  - TNA, Pre assessment and post assessment conducted to evaluate value addition of training

Sources: *https://cutm.ac.in/admission/admission-criteria/*; *https://ruj-bsdu.in/bsdu-jaipur-admission-process/*; *https://nmims.edu/admission*; *https://mettl.com/psychometric-tests/*; *http://www.teamleaseuniversity.ac.in/*

As mentioned earlier, ASU can consider providing for Recognition of Prior Learning (RPL) framework for job roles at NSQF Level 4 (in selected schools) onwards by conducting assessment and certification through respective SSC(s)/ Directorate General of Employment and Training (DGET). Broadly, three types of programs can be offered by each of the finalized school viz. Certificate based programs,

Graduate and Post-Graduate programs (D. Voc/ B. Voc/ M. Voc/B.Sc./BBA) and Specialised research programs (PhD).

The student selection models across each of the abovementioned programs are presented in the table below.

Table 16: Selection models recommended for ASU

Type 1: Certificate based programs INDICATIVE
Admission Test
Mode: Online Test be conducted in Dedicated Test Centres across Assam, neighbouring states and countries **Eligibility Criteria:** Program Specific eligibility criteria should be declared in open forum **Test Sections:** Trade specific sections as relevant to the training program for which the candidate has applied **Implementation:** Implementing Agency may be hired to monitor the test **Qualification:** Candidates successfully clearing the test will be eligible for enrolment till the batch strength reaches 100% **Merit list:** List of candidates eligible for enrolment should be declared in online platforms (ASU website, email to candidates). Eligible candidates should also be informed through phone calls.
Counselling
Objective: To ensure that candidate makes an informed choice **Important pointers to Discuss:** • Courses available at the university • The qualifications to which a program leads, and the further qualifications to which they give access • The occupations to which these qualifications provide access, and the extent to which the qualifications are sufficient for entry • The salary/wage levels offered by these occupations • The projected demand for these occupations **Tools & Implementation:** • Psychometric Tests • Program brochures, presentations and videos • Campus tours – Labs, classrooms and utilities • One to one discussion with trainers
Type 2: Graduate and Post-Graduate Programs (D. Voc/ B. Voc/ M. Voc/B.Sc./BBA)
Admission Test
Mode: • Both online and offline Test be conducted in Dedicated Test Centres across Assam, neighbouring states and countries • ASU can become a part of CEE for engineering related entrances **Eligibility Criteria:** Program Specific eligibility criteria should to be declared in open forum **Selection Criteria:** Admission will be through an Entrance Exam or based on the merit of the qualifying examination. **Test Sections:** General English, General Knowledge, Logical Reasoning and basic knowledge of the related subject area.

Implementation: Implementing Agency may be hired to monitor the test

Qualification: Candidates successfully clearing the test will be eligible for enrolment till the batch strength reaches 100%. ASU may also organise Personal Interviews/Group Discussions for shortlisting candidates in management related courses.

Merit list: List of candidates eligible for enrolment should be declared in online platforms (ASU website, email to candidates). Eligible candidates should also be informed through phone calls.

Counselling

Important pointers to Discuss:

- Interest of candidate
- Educational Qualifications
- Past experience (if any)
- Suggest programs based on interest, qualification experience (international demand also to be considered)
- The qualifications to which a program leads
- The projected demand for these occupations – India and Abroad
- The salary/wage levels offered by these occupations – India and Abroad
- The projected demand for these occupations – India and Abroad

Tools & Implementation:

- Program brochures, presentations and videos
- Campus tours – Labs, classrooms and utilities
- One to one discussion with instructors and faculty members

Type 3: Specialised research programs (Ph.D.)

Admission Test

Mode: Computer based entrance examination be conducted in Dedicated Test Centres across Assam, neighbouring states and countries

Eligibility Criteria: Specific eligibility criteria should be declared in open forum (pertaining to minimum educational qualification-Master degree)

Test Sections: Multiple Choice Questions based test on aspects of research for which the candidate has applied

Implementation: Implementing Agency may be hired to monitor the test

Qualification: Candidates successfully clearing the test will be eligible for a round of Personal Interview (PI) with faculty members. Based on total score (entrance exam and PI) admission offer shall be made.

Merit list: List of candidates eligible for enrolment should be declared in online platforms (ASU website, email to candidates). Eligible candidates should also be informed through phone calls.

Suggested Roles and Responsibilities of Stakeholders

Clear delegation of responsibilities to stakeholders for the various activities in the Selection Process are presented in the table below:

Table 17: Suggested Roles and responsibilites of stakeholders

Stakeholder	Potential Roles and Responsibilities
ASU	• Finalize the selection and counselling strategy for different training models and programs • Development of admission test for different models • Identify testing centres in Assam and implement the admission test in Phase 1 • Develop counselling desk at ASU

INDICATIVE

Stakeholder	Potential Roles and Responsibilities
	• Define process and approach for counselling in different models • Design the selection process for every model and implement admission test and counselling • Fix eligibility criteria for different programs jointly with implementing partners
Admission test implementing agency	• Developing the online admission test for various models • Identification and management of testing centres (if required) • Implementing admission tests through testing centres • Evaluation of admission tests and communicating results • Analytics for improvement of testing process
Implementing Partners	• Support in developing admission tests for different models and programs • Develop score edibility for the program by recommending important traits, skills and knowledge pre-requisites • Support in development of counselling material and process • Support in counselling and trainee selection • Contribute best practices to continuously improve the counselling and selection process

4.5. Career Support and Placement Strategy

Any vocational training program (short or long-term), if not able to enhance employability and provide gainful employment opportunities, would serve a very limited purpose. Higher education as well as skilling institutions (such as SVSU[123], BSDU[124], ISB Hyderabad[125], IIT Bombay[126], OP Jindal Global University[127], Indian Institute of Petroleum and Energy[128] (IIPE)) have a dedicated placement cell to facilitate placement for students through strategic MoUs with industries and industry bodies. In addition, for the purpose of pre-placement counselling and necessary support, both national and international institutes have a 'Career Development Centre'. This centre organises soft skills workshops, career guidance sessions, personality development programs, prepares campus placement preparation module for students opting for placements, conducts various mock interviews, GD, CV workshops and special grooming skills are also provided for developing student skills.

Drawing learnings from national and international institutes of repute, having a well-defined career support and placement strategy will be critical to facilitate quality placements of ASU students. Quality placements bring numerous benefits and positive outcomes both to students and university. It improves student satisfaction in general, and further aids healthy retention and achievement rates in the university and raises its overall profile. Taking cognizance of this, it is recommended that ASU should provide a platform to facilitate interaction between the students and the employers/industries to match the aspirations of the students and the requirements of the recruiters.

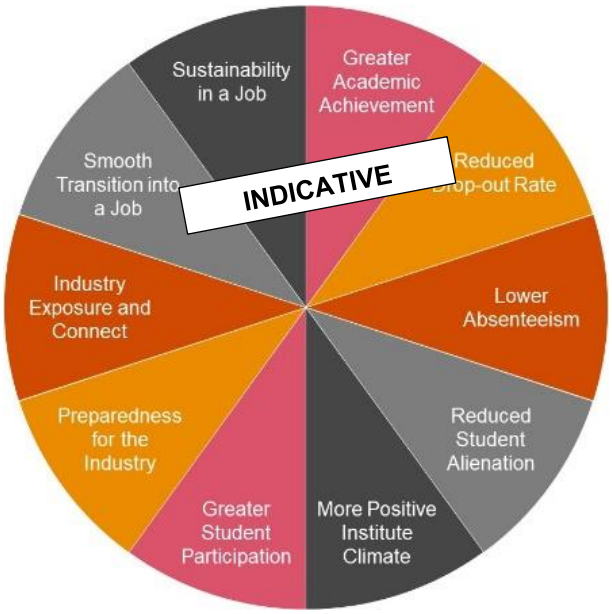
A Career Development Center (CDC) is recommended to be established at ASU which would play a wider role to improve employability of the students as compared to a generic Placement Cell. The CDC at ASU shall act as a platform to drive student and industry engagement in the university. This dedicated cell shall be responsible for implementing the industry engagement strategy along with supporting students in developing a sustainable career in

Figure 35: Objectives of the proposed CDC

[123] https://www.svsu.ac.in/
[124] https://ruj-bsdu.in/
[125] https://www.isb.edu/en.html
[126] https://www.iitb.ac.in/
[127] https://jgu.edu.in/
[128] https://www.iipe.ac.in/

an industry of their choice and fitment. The key objectives that will form the basis of the CDC are illustrated below.

1. **Greater Academic Achievement –** The students should be able to achieve greater academic and industrial excellence.
2. **Lower Absenteeism –** Students should be motivated to regularly attend the institute.
3. **Reduced Student Alienation –** Increased belongingness to the institute.
4. **More Positive Institute Climate –** CDC interventions should ensure a positive climate in the institute, which is conducive for learning.
5. **Greater Student Participation –** Increase students' participation in training and other activities in the institute.
6. **Preparedness for the Industry –** Prepare the students for the selection and on-boarding process of the industry.



7. **Industry Exposure and Connect –** Help students understand the industry and its requirements by way of providing industry exposure through regular connect with the industry.
8. **Smooth Transition into a Job –** Ensure handholding for a smooth transition and on-boarding to a job.
9. **Sustainability in a Job –** Provide post-placement services to ensure that the student retains the job and performs as per the expectations of the industry.

Potential structure of the CDC

It is suggested that the CDC shall be headed by a Career Development Officer (staff member) and team (the team could comprise of senior students). To achieve its intended objectives, the CDC will need to plan its activities across two main tracks viz. Career Support Services and Industry Engagement and Placement Services. The Career Support Services (CSS) can focus on initiatives that would help the student to choose and develop a career. Whereas, the Industry Engagement and Placement Services(IEPS) can ensure that industry is an essential part of the training value chain at ASU. The activities under IEPS shall provide a student with the relevant exposure and knowledge to successfully on-board an industry and perform as per its desired standards. Broad level roles and responsibilities of the CDC (indicative, not limited to) are listed below:

- Create a steady pipeline for existing students to seek internships, OJT, Apprenticeships and final placement
- Work closely with the Alumni Office to provide alternate career advancement opportunities to alumni and also target upskilling opportunities
- Provide career counselling to students and recommend best fit career option based on skill sets, opportunities and aspirations
- While there be a dedicated team undertaking outreach to industries, the placement team will also leverage faculty network, alumni network to place students and appropriate incentive mechanisms will devised.
- Forge connect for OJT/ internships as well
- Enable placement of students
- Invite recruiters and employers

- Organise job fairs
- Facilitate partnership with national and international recruitment agencies
- Placement presentation at various companies
- Organise the Career Counselling sessions throughout the year
- Organise Resume Writing, LinkedIn page, Interview(s) skills development sessions
- Maintain student Resume Bank
- Develop and maintain Corporate Database
- Allocate companies to student groups for image building
- Coordinate all the activities related to Placement and career development

Based on best practices, it is suggested to have a combination of on and off-campus support for students' placement.

- **On-campus support** will involve direct involvement of CDC in getting employers on campus and facilitating placement.

- **Off-campus support**: CDC may support students in accessing the corporate and alumni network, back-end support in terms of developing their profile and preparing for interviews, etc.

In addition, CDC at ASU can also make use of some of the most commonly used methods for inviting industries to the campus for students placements such through social media advertising, word-of-mouth, campus visits, participation in large industry conclaves such as organising conclaves/workshops on skill development initiatives, etc

5. Partnerships and Industry Engagement

A vibrant and collaborative Industry-Institute interaction shall form the backbone for success of the proposed Assam Skills University. In order to become a model university, it is suggested that both industry and the university work in synergistic manner and complement each other. It will be important for ASU to also engage with various large, medium and small sized enterprises/ businesses for the purpose of placement of students as well as to organise industry exposure visits, facilitate guest lectures from industry leaders, guidance from business owners, etc. While most industry linkages can happen through ASU's participation in large industry conclaves, organising conclaves/workshops on skill development initiatives, social media advertising, word-of-mouth, campus visits, etc., it is recommended that the skill university has a well-structured industry engagement and other partnerships strategy.

5.1. Industry-Institute Engagement

The university shall strive to provide an interactive environment to the students to address the needs of the learners and create an effective industry linkages strategy involving design and development of curricula, capacity building of faculty, placement etc. Thus, it is suggested that industry-institute engagement can be a mix of financial and non-financial partnerships such as:

- **Non-Financial (potential)**
  - Industry Exposure (OJT and Apprenticeships)
  - Placement
  - Mentoring
  - Curriculum development
  - Capacity Building of Trainers
  - Research & Knowledge Sharing
  - Provide experience people on secondment
  - International Recognition

- **Financial (potential)**
  - Student Sponsorships
  - Industry Sponsored Labs / COEs
  - Endowments
  - Consultancy

  Some key interventions based on best practices, aimed at enhancing the overall quality and outcomes of various courses envisaged are broadly listed in the table below:

Table 18: Potential areas of collaboration with Industries

	Non-financial partnerships (indicative)
Industry partner for each School/Center	• Industry partner can provide holistic support right from validating the curriculum to facilitating internships and placements • Industry exposure

	• Industries that are a recognised brand in their field may be onboarded as partners. This will also lend greater value to certificate earned. For instance, IBM, Cisco for the School for Information Technology
Curriculum	• Inputs to introduce Employability Skills (communication, convergent, cognitive and workability skills) and Life Skills in curriculum • Periodic review of curriculum (~ once in 2 years) to incorporate technological enhancements and remove redundancy • 'Curriculum Development Committee' which has adequate representation from all stakeholders including industry, government representation and faculty shall play an active role in finalizing and updating curriculum and identifying emerging areas of employment opportunities. *Best Practice: Teamlease Skills University (Gujarat)[129] and University of Paisley (Scotland)[130] have incorporated employability and life skills in addition to the domain-based curriculum by conducting surveys with employers. The same have been inbuilt throughout the training delivery to ensure inculcation of these critical skills required to succeed in job market.*
Capacity Building of Trainers	• Guest Lectures and regular Training of Trainers (ToTs) • Comprehensive "Teachers/ Trainers in Industry" programs varying from 2-6 months *Best Practice: "Teachers in Industry Programme" by university of Arizona: University has partnered with industries for capacity building of institute trainers in the form of paid industrial trainings for 8 weeks every summer, which has helped in improving teaching outcomes, psychological mindset & retention rates of trainers[131].*
Provide experience people on secondment	• Experienced people on secondment will have a particular discipline expertise and will also provide much-needed career guidance • These industry experienced people will also hone the skills of existing faculty in the university who have spent the majority of their careers in academia.
International Recognition	• International recognition for university and courses ✓ Collaborations to enable international accreditations and affiliations ✓ Joint certifications recognized in global job market *Best Practice: Courses offered by GTTI are in collaboration with IHK Nuremberg Chamber of Commerce and Industry (Germany) and Indo-German Chamber of Commerce (IGCC) Chennai. Further, GTTI is certified by TuV Rhineland[132]. Meeting national and international requirements enables standardization of programs in the global market and provides competitive edge.*
Industry Exposure (OJT and Apprenticeships)	• Tie-ups to institutionalize industry exposure through on-the-job trainings and apprenticeship for trainees of all courses. This will resolve the issue of information asymmetry between employers and students. • Webinars by Industry Experts on wide range of topics; published on popular online, networking and live platforms for sensitization on market scenario and emerging skillsets *Best Practice: ISB leverages interactive all year-round webinars with industry experts for knowledge sharing sessions. The school also sensitizes experts on the various programs and their outcomes at ISB to form meaningful partnerships for paid internships[133].*
Placements	• Inputs to develop frameworks on holistic career planning & placement preparation to impart skills for job readiness throughout the course/training delivery

[129] http://www.teamleaseuniversity.ac.in/
[130] https://www.uws.ac.uk/university-life/campuses/paisley-campus/
[131] https://www.arizona.edu/
[132] TUV Rheinland is one of the most respected and highly-trained auditor agency spread across 500 locations in 61 countries
[133] https://www.isb.edu/en.html

	• Captive placements by involving industry from the time of enrolment and selection process • Industry relations cell for industry interactions to manage and overlook the larger industry partnerships and avoiding duplication at university level *Best Practice: The renowned partnership between Bosch and NIT Karnataka has led to the establishment of Bosch Power Tools Laboratory and Training facility at the campus. Students trained at the state-of-the-art infrastructure are offered captive placements, enabling NITK to be ranked third best[134] in placements. Industry has also helped University of South Wales (UK) in developing courses on Career planning & placement preparation; courses are a part of evaluation throughout the training delivery[135].*
Research & Knowledge Sharing	• Create an ongoing mechanism for demand aggregation • Industry-Institute partnership for research in areas of mutual interest; any Intellectual Property (IP) developed is jointly owned *Best Practice: Boeing has funded several projects at IIT-Kanpur in areas of Mechanical, Aerospace, Electrical and Wind-Tunnel Engineering. Institute provides top notch Human Capital and a platform for intellectual discourse, while industry provides funding, scholarships, internship programmes and an opportunity to work with experts from Boeing[136]. TAFE[137] & ITE students[138] conduct applied research projects in partnership with industry to complement formal studies.*
Mentoring	• Tie-ups to mentor students on areas of personal and professional development like, knowledge related to an industry, functional expertise, etc. • Partnerships (with mentors both with technical expertise as well as entrepreneurial background) for Center for Entrepreneurship and Innovation • Participate in 'Meet the mentor' programme' and take Leadership Masterclasses *Best Practice: Entrepreneurship Cells at SNU[139], BSDU[140], SVSU[141], IIT-B[142], etc. have a strong mentorship with mentors both with technical expertise as well as entrepreneurial background. Moreover, mandatory 'Meet the mentor' programmes ensure adequate expert support to the incubates as well.*

Financial partnerships (indicative)	
Student Sponsorships	• Large employers/companies often set aside company funds for a variety of scholarship programs • These may be need-based or merit-based, and often target specific career oriented disciplines • Many of these scholarships can also be dedicated to students pursuing a specific career path that is closely linked to the sponsoring company
Industry Sponsored Labs / COEs	• As part of their CSR initiative or to prepare a pool of industry ready workforce, MoUs can be signed with companies to establish CoEs or sponsor labs in the university • In this industry owned model of training (CoE), industry will hold the major responsibility of training delivery

[134] NASSCOM rankings, 2018
[135] https://www.southwales.ac.uk/
[136] https://www.iitk.ac.in/nwtf/index.php?option=com_content&view=category&layout=blog&id=25&Itemid=108
[137] https://www.tafensw.edu.au/
[138] https://www.ite.edu.sg/
[139] https://snu.edu.in/
[140] https://ruj-bsdu.in/
[141] https://www.svsu.ac.in/
[142] https://www.iitb.ac.in/

	Best Practice: Symbiosis Skills and Professional University has set up 3 Centre of Excellences (CoEs) for road safety, retail and beauty and wellness in collaboration with various industry partners[143], BSDU has with Daikin[144].
Endowments	• Charitable donations are the primary source of funds for endowments which can support the teaching, research and other aspects of the university • Industries can finance a portion of the operating or capital requirements of the university. • ASU may also maintain a number of restricted endowments that are intended to fund specific areas within the university, including professorships, scholarships, and fellowships.
Consultancy	• Consultancy services for industries to develop strategic plans and develop mechanisms to increase the efficiency of industrial workforce • University provides industrial consultancy to develop solutions which can be commercialized by the industry *Best Practice: Through ITE Education Services (ITEES), ITE Singapore provides consultancy and training services in 27 countries across areas such as leadership, infrastructure development, pedagogy design, etc[145]..*

The key measures to build conducive relationship with the industry to leverage industry experience shall include:

- Building synergistic relations with industries around by regular visits and surveys
- Identify technological inventions in operations of the industries for building their competitiveness
- Offer infrastructure of the Institute on hired or rental basis to industries
- Offer to take projects with the industry for assistance where industry does not have necessary expertise
- Offer to take research projects or job work for the Industries where the students can participate
- Induct experienced industrialists on the board or think tank of the university as advisors
- Providing networking platform to the current students to interact with the industry for better opportunities

Taking cognizance of the abovementioned areas of collaboration with the industries, a list of potential industry partners vis-à-vis the shortlisted schools and centres and their focus sectors is attached in Annexure V.

5.2. Accreditation and Affiliation- National

Though several ministries and agencies at national level and across the states have committed to skilling country's youth and future workforce in accordance with NSQF, there is no standard threshold assurance of 'skill attainment' either in the form of 'certification' and/or 'industry acknowledgement', enabling the skilled persons to be 'employable/ employment-ready' or 'industry-ready'. The National Quality Assurance Framework (NQAF) has been a prescription for quite a while, but the same has not been complied fully by skill development interventions so far. Apart from the select success that has been demonstrated across the skilling value-chain by some of the interventions such as DDU-GKY at

[143] https://sspu.ac.in/
[144] https://www.nationalskillsnetwork.in/bdsu-hero-motocorp-mou/
[145] https://www.ite.edu.sg/who-we-are/global-partnerships/international-consultancy-training

the national level, there is a definite need to demonstrate 'Quality' across the ecosystem, which will need to be duly acknowledged and recognized by industries within India and beyond.

In view of the above context, given the scale of operations envisaged by ASU, it is recommended that quality should be at the center of effective skill development programs at the university. Trainees, industry/employers and the general public need to be assured that the training and qualifications provided through skill development programs at ASU are of a high quality and internationally comparable, regardless of who delivers and assesses it within the campus. Therefore, it is recommended that the ASU and its skill development programs must be accredited by professional bodies and industry to ensure best quality training, and national and international recognition.

Understanding Accreditation and Affiliation

'Accreditation' is a process in which the certification of competency or credibility is presented. It is also the act of granting credit or recognition to an educational institution that maintains suitable standards and is perceived as a decision of quality standard and evaluation of an educational institution and its courses by external agencies, often known as 'Accreditation Bodies'. Some key parameters (but not limited to) which are generally considered during accreditation process are outcome of the education provided, quality assurance processes, including internal reviews and grievance handling, complaints and escalation procedures, assessment, legal status, etc.

'Accreditation Bodies' are the organizations that issue accreditation or certify third parties against official standards of accreditation. These bodies ensure that their accreditation practices are globally acceptable, which typically means that they are competent to test and certify third parties, behave ethically, and employ suitable quality assurance practices. Some of the key global accreditation bodies include NOCN UK, Scottish Qualification Authority (SQA) Scotland, UNEVOC, TUV Rheinland, Germany, etc. A few of the national accreditation bodies include NAAC, NBA, NABET, NCVT, etc.

'Affiliation', on the other hand means to attach one-self or bring into close association or connection. It leads to higher level of standardization across individual institutions in terms of curricula, assessment techniques and teaching methods. For instance, colleges in India need to be affiliated to a University to be able to award degrees under the brand name of that University.

Global Framework of Accreditation

The global accreditation framework comprising of different models (minimal, peer review, outcome based, regulatory, etc.) was devised by renowned academicians. Global accreditation bodies follow one or more of these models to provide recommendations and standards to be followed while granting the accreditation. These models help the accreditation bodies decide the approach that needs to be followed based on the maturity of the education/training sector in the country under consideration. After selecting the correct model to be followed, the accreditation body can verify and start the process of granting accreditation. The table below highlights the general applicability of above accreditation models as per the education/training system of the country[146].

Table 19: Accreditation model vis-a-vis education system

Sl. No.	Education system of the country	Applicable accreditation model
1.	Nascent	Focus should be on getting the basics right – processes, quality, compliances
2.	Evolving	Model should be a mix of regulatory and outcome driven factors. India fits as an example in this category
3.	Evolved	Focus should be on setting and maintaining global standards.

[146] www.accreditation.org

Overall, the global trend has been to follow a combination of regulatory and outcome-based accreditation model. In an outcome-based model, a fair amount of flexibility is provided to the institution/program to customize the 'inputs' to get to the desired outcomes. This mixed approach is even best suited for a country like India.

Accreditation Process

Accreditation is a continuous process and broadly consists of the following steps:

- Enquiry and submission of application: The institute or the program requests for an accreditation by applying.
- Preliminary interaction and eligibility: The accrediting body will review the application and the eligibility of the institute or program.
- Self-assessment by Institute: The institute is asked to prepare a self-assessment report in a specific format. This report will provide a comprehensive review of the institute or the program's status and bring in clarity of its day-to-day functioning along with the compliance to the accreditation standards and criteria.
- Field visit by evaluation team: Once the self-assessment report is cleared, an evaluation team comprising senior members from the accreditation body, experts, evaluators, and peers will conduct site visit. The visit will allow the evaluation team to assess factors related to the accreditation criteria that may not be adequately described in the accreditation information, and to obtain further clarification from the institute.
- Accreditation decision: The committee will make a final decision on the accreditation status to be awarded to the institute, based on the findings of the evaluation team. Sometimes conditional accreditation is also provided, which denotes that the institute is required to complete the deficiencies found within a defined time period failing which its conditionally accredited status shall be revoked.
- Follow-up reaccreditation: After accreditation, the institute/program is expected to submit their self-assessment report to the accrediting body on a regular basis. In case the accreditation status of an institute has expired, a new application process must be initiated.

Affiliation Process

The affiliation process broadly consists of following steps and it is based on courses or job roles.

- Preliminary examination of the application by University
- Physical inspection of the institute by committee of experts from University
- Based on the inspection report, the University will decide to grant or not to grant affiliation to the institute
- There are several accreditation bodies in India that work towards ensuring high quality in education/training. These bodies are contributing in the area of accreditation of various institutes, certifications, courses, assessors, and awarding bodies in India. A brief on them is mentioned in the table below:

Table 20: National accreditation and affiliation bodies

#	Name of the Body	Brief	Sectors/ Trades	Type of Accreditation	Partnerships
1	National Assessment and Accreditatio	NAAC is an autonomous body established by the University Grants Commission (UGC) of India to assess and accredit institutions of higher education in the country. NAAC primarily assesses the quality of institutions of higher education that volunteer for the process through an internationally accepted	Higher education	Institute accreditation	Several universities and colleges across country

#	Name of the Body	Brief	Sectors/ Trades	Type of Accreditation	Partnerships
	n Council (NAAC)[147]	methodology. NAAC accreditation determines the standard of education in higher learning institutes. NAAC grade is mandatory for the higher learning institutes to be eligible for various grants of central or state government.			
2	National Board of Accreditation (NBA)[148]	NBA is an autonomous body established with an objective of assurance of quality and relevance of education through the mechanism of accreditation of programs offered by technical institutions based on laid down norms. NBA is completely different from various accreditation bodies in India, as it accredits courses and not institutes, and this is a big difference between the NBA and NAAC. The criteria may include, but not limited to institutional missions and objectives, organization and governance, infrastructure facilities, quality of teaching and learning, curriculum design and review, support services (library, laboratory, instrumentation, computer facilities, etc.) and any other aspect.	Technical disciplines, such as Engineering and Technology, Management, Architecture, Pharmacy, Hospitality and Mass Communication	Course accreditation	Several colleges across country
3	National Accreditation Board for Education and Training (NABET)[149]	NABET is a constituent Board of Quality Council of India (QCI) and is responsible for certification of consulting organizations and educational institutions like schools and ITIs and training programs. NABET has established a mechanism for the accredited certification of educational organizations, vocational training organizations and for accreditation of skill certification bodies. NABET is offering accreditation program for Quality School Governance in the Country, with a view to provide framework for the effective management and delivery of the holistic education program aimed at overall development of students.	Vocational training across sectors	Institute accreditation	Several ITIs and schools across country
5	National Council for Vocational Education and Training (NCVET)[150]	NCVET was notified by MSDE in 2018 after subsuming the existing skill regulatory bodies- National Skill Development Agency (NSDA) and National Council for Vocational Training (NCVT). NCVET is now acting as an overarching skills regulator and is expected to enable integration of fragmented regulatory system and infuse quality assurance across the entire vocational training	Vocational training across sectors	Institute and course accreditation	ITI programs, short-term QP based programs etc.

[147] http://www.naac.gov.in/
[148] https://www.nbaind.org/
[149] https://nabet.qci.org.in/
[150] https://ncvet.gov.in/

#	Name of the Body	Brief	Sectors/ Trades	Type of Accreditation	Partnerships
		value chain, leading to better outcomes. It will regulate the functioning of entities engaged in vocational training, both long & short-term, and establish minimum standards for the functioning of such entities. The major functions of NCVET would be recognition and regulation of Awarding Bodies, Assessment Agencies, and Skill related Information Providers; approval of Qualifications; monitoring and supervision of recognized entities and grievance redressal.			
6	National Quality Assurance Framework (NQAF)[151]	NQAF developed by erstwhile NSDA aims to improve the quality of all skill development programs in India. the framework consists of eight (8) manual, and together they provide guidance for different groups of organizations, describing what each needs to do to meet the quality criteria. Manual 3 (Accreditation of Training/Education Institutions) of NQAF was designed for training/education institutions which are seeking accreditation for the delivery of education and training/skills programs. It does this using four levels of accreditation – Provisional NQAF Accreditation; NQAF Accreditation; Skill India Accreditation; and Skill India Center of Excellence and Innovation, based on quality criteria for each level.	Vocational training across sectors	Institute accreditation	NA
7	Sector Skill Councils (SSCs)[152]	SSCs are the main interface between employers, trade unions, governments and various components of vocational training ecosystem. SSCs are expected to have representation from leading employers on their board and to consult other employers in their sector and other stakeholders when developing their strategies and targets in meeting their key goals. SSCs are promoted by National Skill Development Corporation (NSDC) and they function as autonomous bodies. The key role of SSCs is to conduct skill research, improve the training delivery mechanism, develop	Vocational training across sectors	Institute and course accreditation	Several training service providers across country

[151] https://www.nsda.gov.in/nqaf.html
[152] https://nsdcindia.org/sector-skill-councils

#	Name of the Body	Brief	Sectors/ Trades	Type of Accreditation	Partnerships
		QP/NOS, build quality assurance mechanism for accreditation and recognition of skill institutes, and conduct skill-based assessment and certification for QP/NOS aligned training programs.			
9	Industry Associations [153]	Leading industry association such as FICCI, CII, ASSOCHAM; sectoral associations such as SIAM (Auto), NASSCOM (IT-ITeS); along with regional associations such as Bengal Chamber of Commerce and Industry, among others, recognizes that skill development is an important imperative for achieving India's ambitious growth targets. These associations are committed to working with the stakeholders, especially the industry, government and academia to create sustainable and scalable skills propositions which will benefit the youth of the country from all sections of society.	Across sectors	Institute recognition	Several education institutions across country. For instance, NASSCOM is imparting training programs in technology areas in engineering colleges
10	FICE[154]	FICE, in association with its technology partners brings state-of-art laboratories focused new age technologies, designed to equip engineering students with career skills for a world that is undergoing transformative change. It involves setting up a lab in a campus, physical infrastructure, training faculty members and working with students on an ongoing basis. Wherever required, FICE provide curriculum customization and integration support to participating institutions. FICE is focused on bridging the academia-industry divide, enhancing student employability, promoting innovation and creating an entrepreneurial ecosystem for youth.	IOT, AI, Edge computing, High performance computing	Course accreditation	NTTF
11	Directorate of Technical Education[155]	The department in states run and manage degrees/diplomas in colleges in the state that include engineering colleges, polytechnics, and diploma institutes, along with vocational training programs in ITI institutes. The system produces skilled laborers and techno-entrepreneurial workforces for state industry.	Across sectors	Affiliation	Universities and colleges in respective states
14	Association of Indian	The major responsibility of the AIU is to evaluate syllabi, standards, courses and credits of international	Across sectors	Course accreditation	Acts as a liaison between the

[153] https://ficci.in/; https://www.cii.in/; https://www.assocham.org/; https://www.siam.in/; https://nasscom.in/
[154] https://www.fice.in/about-fice/
[155] States DTE websites

#	Name of the Body	Brief	Sectors/ Trades	Type of Accreditation	Partnerships
	Universities (AIU)[156]	universities and equates the same with the varsity courses offered by universities in India. AIU is also associated with the recognition of diplomas or degrees awarded by UGC-recognised Indian universities.			government and universities and cooperates with other bodies or universities in matters of common interest.

There can be several other sectoral accreditations that may be identified at a later stage once the courses have been finalised.

5.3. Potential Strategic Partnerships

While there is a strong imperative in all general education and TVET institutes and universities to lead in engagement with the industry right from course/curriculum design, training delivery until the students finally pass out and get placed, however, the importance of forging other strategic partnerships cannot be undermined. Partnerships other than with the industries will be key to establishing a robust, contextual and effective skill development and vocational training system at ASU. Strategic partnerships are expected to aid the development, exchange and implementation of innovative practices through cooperation and peer learning, facilitates recognition and validation of knowledge, skills and competences, tackles skill gaps and mismatches and leads to inclusive skill development ecosystem. In order to identify areas of strategic partnerships and potential partners for ASU, in-depth secondary research was undertaken of various institutes of national and international repute to draw learnings and key insights from their best practices.

Every year ITE Singapore sends its students across 25 countries as a part of its Overseas Student Exchange Programme where students attend classes in international institutions and earn credits[157]. In Cambodia, NTTI cooperates with many universities and institutes in the Association of Southeast Asian Nations to attend the training program sponsored by Association for Overseas Technical Cooperation and Sustainable Partnerships (AOTS), and the California State University, Fresno, in the United State of America[158]. Further, at CRC UK, students and educators from various countries such as Italy, Czech Republic, Finland, etc. visit CRC for a range of activities, discussions and work placements. It also has partnership with top awarding bodies, including AAT, ACCA, City & Guilds and CACHE[159]. MITT Canada has MOUs with many peer post-secondary institutions throughout Manitoba as well as arrangements with various community groups[160]. Indian institutes and universities such as BSDU[161], CUTM[162], ISB Hyderabad[163], IIT Bombay[164], SNU[165], DU[166], TeamLease Skills University[167], OP Jindal Global University[168], NTTF[169] and IIPE[170] have forged partnership with many national and international

[156] https://www.aiu.ac.in/
[157] https://www.ite.edu.sg/who-we-are/global-partnerships/global-education
[158] https://www.ntti.edu.kh/international_linkages.php
[159] https://www.camre.ac.uk/
[160] MITT Annual Report 2018-19
[161] https://ruj-bsdu.in/
[162] https://cutm.ac.in/
[163] https://www.isb.edu/en.html
[164] https://www.iitb.ac.in/
[165] https://snu.edu.in/
[166] http://du.ac.in/
[167] http://www.teamleaseuniversity.ac.in/
[168] https://jgu.edu.in/
[169] https://www.nttftrg.com/
[170] https://www.iipe.ac.in/

institutes and universities to promote education, scientific cooperation, create mobility and exchange programmes for teachers, researchers, and students, offer joint degree programmes and enhance technological , social and cultural bondage between countries. Moreover, institutions such as CUTM, GTTI[171], SVSU[172], KGTTI[173], BSDU have partnership with MSDE, NSDC, SSCs and offer joint certifications to students with many academia partners.

Drawing learnings from abovementioned best practices and taking cognizance of ASU's objectives, following strategic partnerships have been identified which would be critical for the smooth functioning of ASU operations. In addition, the rationale for each partnership, areas of collaboration and some potential partners (but not limited to) have been mapped.

Through partnerships with other academic institutions, ASU, its faculty members/trainers and students will have the opportunity to engage with a diverse set of learners, enhance their teaching practices and explore different innovative pedagogies. It is also important to note that maintaining effective strategic partnerships with other institutions would facilitate rich student experience, create a robust learning and teaching environment, promote academic research and generate new revenue avenues for ASU. Such collaborations would also help build ASU's brand awareness, expand its national and global outreach and attract students from diverse backgrounds and geographic regions. Recognising the many benefits that come with forging collaborations with other skilling and general education institutes, it is suggested that ASU partners with some national and international institutions. **Some of the potential areas of collaboration with other institutions include Co-teaching and joint certifications, Guest lectures, immersive modules, ToTs, ToMTs, Curriculum development, assessment and certification and exposure visits.**

Partnership with select SSCs, national and state government

In addition to diploma and degree courses, ASU may offer various short-term training programs aligned to the NSQF levels. Thus, ASU's partnership with select SSCs based on the identified schools and focus areas for QP aligned courses will be important for assessment and certification purposes. In addition, lot of identified training programs/courses can be implemented through the existing skill development programs such as the DDU-GKY and schemes such as PMKVY and PMKK, and other State-level flagship schemes/ programs. These projects and schemes have funding provisions to implement training programs and manage the entire training life cycle. ASU can access the funds and leverage on its training infrastructure by collaborating with the relevant Nodal Ministries/Departments/Agencies such as ASDM.

Partnership with international assessment, certifying and training agencies

As per several labour mobility studies, remittances of skilled and certified resources are way more than unskilled workforce. To ensure that ASU enables international mobility of youth, the need of the hour is to forge strategic partnerships with suitable agencies/bodies for assessment and certification. In the middle east, NCVT certification and certifications from UK and Scotland agencies are acceptable. Similarly, the qualifications under the Australian Qualification Framework and Scottish Qualification framework are acceptable for employment in Australia and UK respectively. Thus, partnerships can be formed with such agencies to offer internationally acceptable qualifications at ASU at a reasonable cost.

The table below presents the list of institutional and other strategic partners for the skill university critical for an immersive learning experience and global recognition of ASU:

[171] https://www.gttiinfo.com/
[172] https://www.svsu.ac.in/
[173] http://kgtti.com/

Table 21: Potential institutional and other strategic partners for ASU

Potential schools	Focus areas	Indicative Institutional and other strategic partners
School of Agricultural and Food Technology (INDICATIVE)	**Agriculture and Food Technology**	• Assam Agriculture University • Assam University • Tezpur University • Agriculture SSC • National Institute of Agricultural Extension Management (MANAGE)
	Tea	• Tocklai Tea Research Institute • NITM, Darjeeling Tea Research and Management Association • The Tea Tasters Academy • Dibrugarh University • Agriculture SSC
	Bamboo Technology	• Cane and bamboo technology center, Guwahati • Bamboo U, Indonesia • Bamboo treatment facility, Indonesia • Center for Bamboo Development, Philippines
	Horticulture (including spices)	• Assam Agriculture University • Institute of Horticulture Technology • NIPHT-Horticulture Training Center • International Horticulture Innovation and Training Center • Agriculture SSC • Food Industry Capacity & Skill Initiative
	Animal Husbandry, Sericulture and Fisheries	• Assam Agriculture University • National Dairy Research Institute (NDRI), Kamdhenu University Nanaji Deshmukh Veterinary Science University • Central Silk Research & Training Institute • Central Institute of Fisheries Education • Food Industry Capacity & Skill Initiative • National Institute of Agricultural Extension Management (MANAGE)
School of Technology	**Information Technology**	• IIT Guwahati • IIIT Guwahati • Assam Don Bosco University • NIT Silchar • Assan Downtown University • Jorhat Institute of Science & Technology • NASSCOM SSC • ITE Singapore • NTTI Cambodia • TAFE Institutions Australia
	Data Analytics, AI and Cloud	• NIIT • Techdata Solutions • AnalytixLabs • Jigsaw Academy

Potential schools	Focus areas	Indicative Institutional and other strategic partners
		• ITE Singapore • NASSCOM SSC
	New age Technologies	• Assam University • Springboard • UpGrad • ITE Singapore • NASSCOM SSC • Instrumentation Automation Surveillance & Communication SSC • NIIT
School of Design and Creativity	**Design**	• North East Institute of Fashion Technology • Indian Institute of Handloom Technology • Institute of Industrial Design • National Institute of Design • Handloom and Handicraft SSC • Textile SSC
	Media and Communication Studies	• Zee Institute of Creative Arts • MET Institute of Mass Media • Dibrugarh University • Royal Global University • Media and Entertainment SSC
School of Manufacturing and Construction	**Mechatronics and Robotics**	• Institute for Design Of Electrical Measuring Instruments • IIT Kanpur • BITS Pilani • Manipal Institute of Technology • Jadavpur University • Capital Goods SSC • Instrumentation Automation Surveillance & Communication SSC
	Engineering	• Indira Institute of Aircraft Engineering • Indian Aerospace and Engineering College • IIT Bombay • VIT • Assan Downtown University • Manipal Institute of Technology • Life Sciences SSC • Aerospace and Aviation SSC • ITE Singapore • TAFE Institutions Australia
	O&G	• Rajiv Gandhi Institute of petroleum technology • Petroserv Institute of Technology • Indian Institute of Petroleum Energy • Mining SSC • Hydrocarbon SSC

Potential schools	Focus areas	Indicative Institutional and other strategic partners
	Electronics	• Indian Institute of Solar energy • Suvidya Institute of Technology Pvt. Ltd. • Lalji Mehrotra Technical Institute • ITI Malaysia • Electronics SSC
	Metal technology	• National Institute of Foundry & Forge Technology • Indian Machine Tool Manufacturers' Association Technology Centres • ITI Malaysia • Iron and Steel SSC • Capital Goods SSC
	Building and Construction	• Institute of Infrastructure Studies and Project Management • Indian Green Building Council • Institute for Certification and Quality Mark • TAFE Institutions Australia • Construction SSC • Infrastructure Equipment SSC • Plumbing SSC • Iron and Steel SSC • Capital Goods SSC
School of Sustainability	**Climate change, Environment and Sustainability**	• Indian Institute of Solar Energy • Indian Institute of Engineering Science and Technology Shibpur • Birla Institute of Technology, Mesra • NIT Kurukshetra • CRC UK • Skill Council for Green Jobs
School of Mobility	**Logistics and Supply Chain**	• The Institute of Supply Chain Management • Institute of Logistics and Aviation Management • Symbiosis Institute of Management Studies • Indian Institute of Logistics • Logistics SSC
	Ports and Inland Water Transport	• Maritime Training Institute • National Inland Navigation Institute • Crew Training Centre of Inland Water Transport Department, Assam
	Civil Aviation	• Indian Aviation Academy • Star Fly Aviation Academy • Aptech Aviation & Hospitality Academy • Aerospace and Aviation SSC
School of Management and Finance	**Management**	• IIMs • Xavier Institute of Management • International Institute of Sports Management • Assan Down Town University • National Institute of Event Management

Potential schools	Focus areas	Indicative Institutional and other strategic partners
		• National Institute of Agricultural Extension Management (MANAGE) • Agriculture SSC • Retail SSC • Sports, Physical Education, Fitness and Leisure SSC
	Banking, Insurance and Financial Services	• NIIT • BFSI Academy • Imarticus • International College of Financial Planning • BFSI SSC
School of Tourism, Hospitality and Wellness	**Tourism and Hospitality**	• Indian Institute of Hotel Management • Pacific Institute of International Air Ticketing and Travel Management • College of Vocational Studies • Panache Academy • Tourism and Hospitality SSC
	Wellness	• ISAS International Beauty School • VLCC Institute of Beauty & Nutrition • JD Institute of Fashion Technology • National Institute of Ayurveda • ITE Singapore • NTTI Cambodia • CRC UK • TAFE Institutions Australia • Beauty and Wellness SSC
School of Healthcare	**Healthcare and Health Technology**	• College of Veterinary & Animal Sciences • Kohinoor College of Paramedical Science • Asian Institute of Nursing Education • Assan Down Town University • ITE Singapore • Healthcare SSC
Center for Entrepreneurship and Innovation		• EDII • Wadhwani Foundation • VisionRi • UpGrad • Management institutions such as ISB, IIMs, IITs • Enterprise Singapore's accredited Mentor Partners (such as Cocoon Capital, Eight Mercatus, etc.) • Grassroots Innovations Augmentation Network • Management & Entrepreneurship and Professional Skills Council
Center for Life Skills and Languages	-	• EduPristine • Mentora • Cambridge Institute

Potential schools	Focus areas	Indicative Institutional and other strategic partners
Center for Lifelong Learning (distance learning and online learning)	-	• NMIMS Global Access School for Continuing Education
Center for Faculty and Curriculum Development	-	• NITTR • TAFE (Australia) • ITE Singapore • IIT Guwahati • SSCs

Partnership with international governments

With 62% of its population in the working age group and more than 54% of total population below 25 years of age, India is considered to be one of the youngest nations in the world. Compared to western economies like USA, Japan, Europe where there is a burden of ageing population, India's population pyramid is expected to bulge in the 15-59-year age group over the next decade. Moreover, while labour force is expected to decline by 4% over next 20 years in industrialized countries, that in India will increase by 32%[174]. In addition, there are numerous countries such as Singapore, Australia, Canada, Japan, South Korea, etc. which are quite open to movement of labour force from other countries. Taking cognizance of India's demographic dividend advantage and developed countries allowing easy mobility of workforce, it will be critical to forge strategic partnerships with the governments of such countries to make India global reservoir of manpower supply.

In this context, ASU can act as a facilitator in forging partnerships with other governments, to promote government to government agreements for mobility of labour force. These partnerships could be like the Technical Internship Training Programme (TITP) initiated by the MSDE in collaboration with the Japan Government[175]. Such international collaborations would promote transfer of skills, knowledge and technology amongst the participating countries thereby contributing to human resource development.

Partnership with other national missions

Government of India has launched several targeted missions in last few years such as Digital India, Start-up India, Stand up India, Smart Cities Mission, Mudra Yojana, etc. Depending on its strategic and operational requirements, it is suggested that ASU forges partnership with abovementioned missions as appropriate. For instance, entrepreneurship development is one of the major mandates of ASU, which would require financing support to potential entrepreneurs whose ideas/prototype are promising; partnerships with missions such as Start-up India, Stand-up India and Mudra Yojana could provide vital support in financing. Similarly, Digital India is rapidly scaling-up and connecting the unconnected parts and systems of the country through internet, which would require large number of trained manpower trained in digital technologies (basic and advanced). ASU can partner with the mission to secure and deliver the mandate of providing the required skilled manpower.

While some of these partnerships may develop organically as ASU delivers its activities, others may have to be facilitated and coordinated to act as a catalyser to smoothen the skilling operations. The key to the success of abovementioned strategic partnerships lies in ensuring that expectations of ASU and its potential partners are well understood, there is good communication and that both ASU and its partners benefit from the partnerships.

Strategic alignment with World Skills

'WorldSkills International' (WSI) was introduced in the year 1950 as a not-for-profit association with the overall objective of promoting vocational education and training across the globe through organising

[174] National Policy on Skill Development and Entrepreneurship 2015
[175] https://nsdcindia.org/about-titp

biennial international skills competitions. It has witnessed an exceptional growth over the past decades with its number of member countries reaching to 85 (including all of the G20 countries) and scale of competitions growing dramatically. The competition regarded as the equivalent of Olympic games for skills is the largest skill competition in the world held every two years in one of WSI member countries[176]. The 46th WorldSkills Competition will be held in Shanghai, China from 22-27 September 2021 where age is the only eligibility criteria. While for most of the trades candidates must be born on or after 1 January 1999, however, for trades like mechatronics, manufacturing, aeronautical engineering, cloud computing, cyber security and water technology, IT network cabling, the competitor must be born on or after 1 January 1996[177].

Over 1,000 contestants from across the globe compete with each other for a period of four days working on test projects having duration of 16-22 hours which are designed as per industry standards and infrastructure. Currently, 56 trades (detailed list attached in Annexure III) have been identified by WSI for skill competitions which fall under six broad skill categories[178]:

- Construction and Building Technology
- Transportation and Logistics
- Manufacturing and Engineering Technology
- Information and Communication Technology
- Creative Arts and Fashion
- Social and Personal Services

However, meeting the excellence standards required at the competitions depends on a country's TVET ecosystem as a whole, i.e. TVET policy, quality of trainers, curriculum and assessment methodologies. Taking cognizance of this and to make India the skills capital of the world, NSDC under the aegis of MSDE set-up IndiaSkills/ National Skills Competition. Moreover, India's membership at WSI is held by MSDE and the operational responsibility rests with NSDC. The national level skills competition has pan India coverage and these are also organised every alternate year[179]. The national level competitions target youth of the country including SC/ ST, girls (at least 30% participation of girls at every level) and physically challenged people. While MSDE through NSDC is responsible for conducting competitions at regional and national level, States/State Skill Development Missions have the responsibility of organizing competitions at the district and state level in partnership with SSCs, local industry, academic institutions, chamber of commerce, etc. adhering to guidelines of the competitions laid by WorldSkills India.

The state govt. /SSDM along with its partners mobilizes potential competitors through print and electronic media followed by their registration (capturing personal details, skill/trade for participation, highest educational qualification attained along with supporting documents/proofs) on SSDM or WorldSkills India website. Registered candidates are then shortlisted based on Date of Birth norms and through an initial screening/ evaluation of skill and knowledge levels. Further, states/SSDMs/State Skill Competitions Committee have to identify trades of interest (based on training facility, geography and heritage of their state) from the master list of WorldSkills for skilling competitions[180].

Figure 36: Journey towards WorldSkills Competitions

Source: WorldSkills India

[176] WorldSkills Vison 2025: Strategic Plan
[177] https://worldskills.org/what/competitions/wsc2021/
[178] Guidelines for Regional & State Skill Competitions: IndiaSkills and NSDC
[179] https://worldskillsindia.co.in/worldskill/indiaskills.php
[180] IndiaSkills, Regional & State Skills Competitions handbook May 2019

It is noteworthy that emerging winners from district compete at the state level and champions sprouting out of state level competitions get trained under the aegis of state experts for competing at the regional level (North, South, East, West and North East). The experts (have minimum 10 years industrial and/or practical experience in the skill in which they are accredited) act as mentors for training/skill upgradation of the candidates as per international level. Regional level winners are trained on WorldSkills modules by IndiaSkills team who in turn compete at the national level. NSDC works with States and SSCs to plan and organize training of national level winners leading to the final squad selection for WSC and other international competitions. Further, states are recommended to invite various types of institutes for the purpose of screening/internal competitions to shortlist candidates for district / state level competitions provided they meet the age criteria. An indicative list of institutes is shown in the adjacent exhibit.

Figure 37: Tentative list of institutes

Source: Guidelines for India Skills, NSDC

IndiaSkills/WorldSkills India leading to WorldSkills and other international competitions are designed based on WorldSkills format and all the districts and states are expected to adhere to the same format, guidelines and norms for conducting competitions.

To bring uniformity in skills competitions, align skill standards of all member countries to international level and improve the quality of national VET systems, WSI introduced the WorldSkills Standards Specifications (WSSS)/WorldSkills Occupational Standards. WSSS specifies the knowledge, understanding and specific skills that a competitor must possess with the objective of reflecting international best practices. The Standards Specification for each trade is divided into different sections and each section is allocated a percentage of the total marks reflecting its relative importance within WSSS. At present, WSSSs are available for 56 trades across abovementioned six skill categories. Additionally, the marking scheme and test projects at WSI competition assess only skills which have been laid out in the Standards Specification and marks are allocated (allowing a variation of 5%) as have been set out in WSSS. Thus, WSSS acts as a guide to all competitors preparing for the competitions[181]. The experts' team in India along with NSDC and IndiaSkills team's support imparts training to the candidates, i.e. representatives at the WSI competitions in line with these standard specifications which are also available on IndiaSkills website. NSDC also assists with providing sample test projects, infrastructure list, assessment and marking schemes for all WorldSkills trades.

Another critical aspect to be considered while preparing candidates for this worldwide skills competition is the assessment criteria followed by WSI. Assessment at the competition is broadly of two types- measurement and judgemental with each competition having a maximum of 100 marks. With respect to measurement, assessment decisions available are either binary (yes/no) or against a pre-determined scale of conformity to a given benchmark. For judgement, candidates are given scores from 0 to 3 reflecting industry and business best practices:

- 0: performance below industry standard (including a non-attempt)
- 1: performance meets industry standard
- 2: performance meets and surpasses that industry standard to some extent
- 3: excellent performance relative to industry's expectations/standards.

Each marking form lists down aspects to be assessed and marked by following either one of the assessment methods or both measurement and judgement[182]. In addition, WSI lays down minimum requirements for a particular skill/trade for the skills competition referred to as 'Technical Description' which every member country needs to adhere to while sending its representatives for the competition.

[181] https://worldskills.org/skills/
[182] https://worldskills.org/skills/

The technical description (available on IndiaSkills website) charts out details on assessment strategy, marking scheme, test projects (format/structure, design requirements), skill specific safety requirements (use of safety glasses, shoes, helmets, etc.), materials and equipment (facilities provided by the competition organizer, competitor's tool box specifications) and skill specific rules (personal IT equipment, data storage devices, internet access, procedures and work flow)[183].

Strategy for preparing students for World Skills Competition

Once the rules and requirements of the national and international skills competitions are known, preparing the students in a way that they have the necessary skills and knowledge to qualify and win competitions, it will be important to devise an effective strategy so that students from ASU can bring laurels not only to the university but the country as a whole. Some of the strategies which ASU can consider and adopt while preparing students for national and international skills competitions are charted below:

Shortlisting students: The first part of preparation would be to identify and shortlist students who would represent ASU in national level competitions. For this, ASU can consider organizing various internal competitions on a bi-weekly basis which in turn would instill a sense of inquiry, enhance thinking skills and build mental toughness among the students. Teachers/trainers can act as facilitators of these internal competitions by deciding on the competition theme, specific content areas, timelines, guidelines and awards for winning students. Winners of these internal competitions would represent ASU for skills competitions (at district, state, regional, national and international level).

Counselling: Once students are identified; they would undergo counselling sessions since participation in any type of competition is often nerve-wracking and leads to unhealthy stress especially when someone is representing his/her institute and country. Thus, ASU can consider organizing regular counselling sessions for the shortlisted students at regular intervals of time before the competitions so that they are able to handle frustration, anger and sense of sluggishness while competing and making them understand that not winning/succeeding isn't equivalent to failure. These sessions can be undertaken by specialized competition counsellors, faculty/staff of ASU.

Extra coaching sessions: While shortlisted students would attend regular classes in the institute, extra classes/coaching sessions can be organized for them in a way that ensures alignment with WorldSkills Standard Specifications. Students would have better winning chances when the curriculum and coaching is as per learning outcomes as charted in WSSS. Since assessment in the competitions is as per industry best practices, forging collaboration with industries will be instrumental while imparting training to the shortlisted students. ASU can leverage on its recruitment partners and seek support of local industry associations (based on trades/sectors) for giving extra classes to students in line with industry standards. In addition, the past papers available on IndiaSkills and SSDMs websites can be accessed for better preparing students.

Regular assessments: Frequent testing based on WSSS would help improve students' performance and reduce the pressure of big, infrequent skills competitions. Thus, trainers at ASU can design weekly tests/quizzes requiring students to earn a passing grade. However, a critical consideration while developing the test or quiz would be to ensure that test items address the content and specific performance indicators as outlined in the curriculum, i.e. WSSS.

Practice under pressure: Since students enter competitions in a state of high stress, students who have been through the drill are expected to do better on the actual day of competition. ASU can get the shortlisted students interact with ex-winners and participants of national and international skills competitions and then make them demonstrate their skills in front of the entire class, school personnel, other trainers. As students begin to mature and understand expectations, they can be asked to perform in the business/industry community for more practice and boosting confidence. While students will still be nervous on the day of competition, but they will be far more confident than other competitors due to their rigorous practice.

Quality trainers: The trainers/teachers should be well prepared to help students. They should be well acquainted with WSI specification standards, assessment criteria, expected industry standards, etc.

[183] https://worldskillsindia.co.in/worldskill/downloads.php

and keep themselves abreast of changes in marking scheme and curriculum of WSI, addition/deletion of any trades, SOPs to be followed, toolkits required at the competitions location, etc.

Going forward it is recommended that ASU aligns all its training programmes/courses to WSI for which WorldSkills Standard Specification/Occupational Standards are available so that it is well ahead of other skilling/general education institutes and universities in preparing the WSI competition ready youth. In addition, students from ASU will also have a competitive edge over participants from different institutes in both national level/IndiaSkills and WorldSkills competitions if effective strategies are adopted for preparing its students for such competitions. The detailed list of trades for which technical description and WSSS is available has been attached in Annexure III and a sample of WSSS has been attached in Annexure IV.

6. Governance and Administration

6.1. Governance Structure and Administrative Mechanisms

The philosophy of governance is to run the university democratically at the premier level of effectiveness using modern management techniques striving for academic excellence. An effective governance system is the key to the successful operation of any university. In order to adopt a model of governance with transparent decision making, accountability and participation from all stakeholders, an innovative governance structure must be developed that will ensure compliance with the envisaged democratic system. Governance systems, structures and processes generally are fundamentally stronger where women participation and their perspectives are included. Therefore, the University shall strive towards ensuring equal access and compulsory participation of women at a minimum specified level in power structures and highest decision-making level. The governance structure at Assam Skill University (ASU) shall be guided by the following principles:

- Ensure systemwide communication and active participation from all stakeholders to attain reasonable consensus
- Cater to pressing issues in a streamlined, accommodative and flexible way
- Allow equal opportunity to all stakeholders in the policy-making process to voice their opinions and suggestions

Officers of the University

The following shall be the officers of the University, namely;

a) the Chancellor;
b) the Vice-Chancellor;
c) the Registrar;
d) Controller of Examinations; and
e) Such other persons in the service of the University, as may be declared by the Statutes to be officers of the University.

Roles & Responsibilities of Key Senior Position

a) Chancellor: The Chancellor shall provide strategic direction, guidance and inputs to ensure alignment with the Vision and Mission of the University.

b) Vice-Chancellor: He/she will be the overall in-charge of all the academic and administration of the institute and plan for development and running of the University.

c) Registrar: He/she shall head the Administrative unit of the University and shall report to the Vice-Chancellor.

d) Controller of Examinations: He/she shall hold various examinations of the University, its constituent institutions if any and shall ensure that the results are declared in time.

e) Head of Departments: They will hold independent charge of their departments concerned and plan the development of the department, procurement of equipment, furnishing of labs, designing and supervising session plans, overseeing student activities and general upkeep of the department.

Authorities of the University

In addition to the Court, Executive Council, Skill Council, Finance Committee, Faculties/Department as mentioned in the ASU Act, it is suggested that following council/committee be the statutory authorities of the university. These additional ones were identified based on consultations with ASDM team.

a) Board of Studies;
b) the Planning Board;
c) Estate Management Committee;
d) Grievance Redressal Committee

Details regarding the composition and the broad functions of each of the statutory authorities listed herein above are briefly outlined below:

The Court

The Court shall be the highest body providing advice to the Chancellor on all matters of the University. It will have representation from a diverse set of interest groups such as State Government, Industries, other Universities and ASU. The powers and functions of the Court shall include reviewing policies and programs, recommending suggestive measures for further development and oversee approval pertaining to annual reports, finance budget, audit reports etc.

The Executive Council

It will be the prime executive body of the university with the main responsibility of general management and administration of the university. The Executive Council shall be responsible to manage and regulate the finances, accounts, investments, property, business and all other administrative affairs of the University including reviewing short and long-term academic reforms, research & development activities and recruitment of university personnel.

The Skill Council

It shall be the principle academic authority of the university with the prime role of academic management of the university. The Skill Council shall exercise general supervision over the skill and academic policies of the University and shall give directions regarding methods of instruction, co-operative teaching among skill colleges and skill institutions, evaluation of research or improvements in skill and academic standards. The Skill Council shall also prescribe syllabi and courses of study for various examinations on the recommendations of the Departments/Faculties.

The Finance Committee

The purpose of the Finance and Audit Committee is to examine and scrutinize the annual budget of the University and make recommendations on financial matters to the Governing Council. The functions also include responsibilities relating to financial planning, audit process, financial reporting, consider proposals for new expenditure and reviewing the finances of the University from time to time.

The Faculties/Department

The Executive Council on the recommendations of the Skill Council may institute such Department/Faculties in the emerging areas of skill. The Department or Faculty so constituted shall exercise powers to promote quality skill education to meet qualified skill requirements of growing economy and to address the skill gaps.

The university may plan to institutionalize following committees whose powers functions would be defined by the Chancellor/Vice Chancellor/Executive Council as applicable. The manner of appointment and powers and functions shall be such, as may be prescribed by the Statutes.

Board of Studies

The major function for Board of Studies include framing new content and revising existing content for various certificate/diploma and undergraduate/postgraduate courses from time to time, introducing new courses of study and recommend the Skill Council the rules, regulations and minimum qualification required for admission into course concerned. The Board of Study shall be constituted on the recommendation of the Executive and Skill Council.

The Planning Board

The Planning Board shall advise on the planning and development of the University particularly in respect of the standard of education and research in the University. It shall also advise on pedagogy, curriculum, assessments & projects of the diploma and degree programs to make them industry relevant and globally competitive. The recommendations of the Board shall be implemented after they are approved by appropriate authorities of the University.

Estate Management Committee

The Estate Management Committee shall advise the University officials on all aspects of the University estate, including buildings, grounds and infrastructure services. It shall be responsible to review infrastructure requirements and budget, liaise with contractors on progress of infrastructure development & drive maintenance plan & renting of facilities for commercial purposes.

Grievance Redressal Committee

The objective of the Grievance Redressal Committee shall be to ensure fair and impartial mechanism for redressal of varied issues faced by varied stakeholders in the University such as students, parents and staff members. The cell shall facilitate the resolution of grievances in a fair and impartial manner, maintaining necessary confidentiality, as the case may be. The committee shall also ensure effective redressal of complaints of sexual harassment against women and prevent and protect women against workplace sexual harassment. This shall be in adherence to the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (“POSH Act”).

6.2. Human Resources Development

The performance of the University is defined by the human resources associated with it. In today’s competitive world the key indicator of an organization’s strength is the quality of its human resources. Therefore, development and growth of this resource is necessary for the organization to grow. This also requires developing a robust Human Resource Management strategy that complements the strategic priorities of the university.

Creation of Teaching and Non-Teaching Posts

The University shall not be authorized to create any teaching and non-teaching post or even revise the pay scales of the teaching and non-teaching employees without obtaining the prior approval of the State Government. However, the Executive Council of the University can recommend creation or abolition of teaching and non-teaching posts to the State Government.

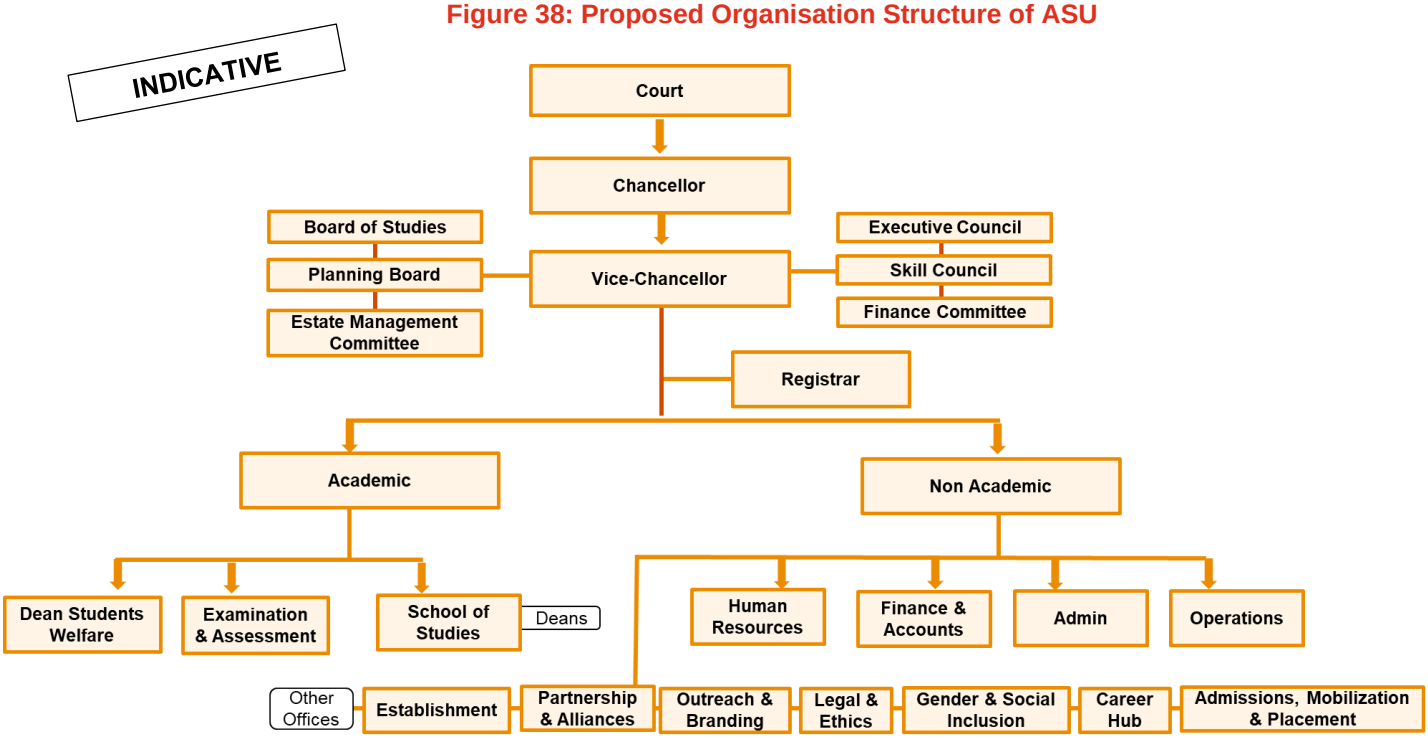
Appointment of Teaching and Non-Teaching Posts

The Assam Skill University will adopt a process of free, fair and transparent recruitment for all staff. All appointments to teaching and non-teaching posts shall be made by the Executive Council on the recommendations of the Selection Committee. The appointment of the selected candidates by the Executive Council shall be subject to approval of the Chancellor. The Vice-Chancellor can exercise his power, where necessary, to make an ad-hoc or temporary appointment for a period not exceeding six months, if it is not feasible to make regular appointment.

Proposed Organization Structure

After reviewing the organization structure of similar institutions[184] (insights in Chapter 6), the recommended organization structure of the proposed Assam Skills University is depicted below:

Figure 38: Proposed Organisation Structure of ASU



Indicative Roles and Responsibilities of Key Officials[185]

A) Chancellor: The Chief Minister of Assam by virtue of his office shall be the Chancellor of the University. By Virtue of being the Head of the University, he shall:

- Provide strategic direction, guidance and inputs to ensure alignment with the Vision and Mission of the University
- Preside over the convocation of the University for conferring degrees and meetings of the Court
- Ensure that all statutory authorities exercise collective responsibility in the course of decision making
- Have the right to order an inspection of the university buildings, laboratories, library, administration of finances of the University, colleges or institutions

B) Vice-Chancellor: The Vice-Chancellor shall be the overall in-charge of all the academic and administration of the institute and plan for development and running of the University. He/she shall:

- Exercise general supervision and control over the affairs of the University and oversee the decision-making process of all the authorities of the University
- Be the interface between the University and local, state, national and international governmental and non-governmental agencies and institutions to promote the University to the larger audience

[184] Haryana Vishwakarma Skill University, Rajasthan ILD Skills University, Shiv Nadar University Noida, Karnataka German Multi Skill Development Centre Society, Centurion University of Technology & Management School 0f Vocational Education & Training, Institute of Technical Education, Singapore

[185] The roles, responsibilities and powers apart from the officers of the university shall be such, as may be prescribed by the statutes. The roles and responsibilities mentioned here are suggestive and indicative in nature.

- Prescribe duties to all officers of the University including the Registrar, Heads of Departments, Controller of Examinations as well as administrative heads

C) Registrar: The Registrar shall be the Chief Administrative Officer of the University working directly under the leadership and direction of the Vice-Chancellor. He/she shall:

- Be appointed by the Chancellor on the advice of the State Government
- Receive complaints and suggestions with respect to the improvement of administration, and thereby take corrective actions
- Organize training and orientation programs for non-teaching staff in the University

D) Controller of Examinations: The Controller of Examination shall:

- Prepare and announce the schedule of examinations
- Hold various examinations of the University, its constituent institutions if any
- Timely process and ensure that the results are declared in time
- Take decisions regarding postponing or cancelling the examinations, partly or fully, in the event of malpractice

E) Controller of Finance: The Controller of Finance shall:

- Exercise general supervision over the funds of the University and advise in terms of adhering to the financial policies
- Design, develop, implement, and ensure compliance with internal financial and accounting policies and procedures
- Bring to the notice of the Vice-Chancellor any unauthorized expenditure or any other financial irregularity
- Constantly monitor the cash and bank balances and other investments
- Be responsible for preparation of the annual accounts and the budget of the University in consultation with the leadership team
- Perform other financial functions as may be assigned or prescribed to him by the Statutes

G) Director – Human Resource: The key roles and responsibilities of the Director – HR include:

- Overall management and supervision of the staffing and learning & development related activities in the university
- Work with the team of HR executives to design, develop, and prepare HR policies and procedures including leave benefits, appraisal system, exit management etc.
- Devise a performance appraisal mechanism with list of KPIs for staffs across all positions
- Identify the learning and development needs of staffs across schools and organize periodic training sessions
- Manage other activities at the institute related to workplace safety and grievance redressal

H) Director – Outreach and Branding: The key roles and responsibilities include:

- Overall supervision and management of the outreach, branding and communication related activities of the institute
- Prepare annual budget in coordination with the inhouse team
- Plan and implement various outreach/branding strategies formulated by the team and ensure all communication and marketing efforts are in line with vision, mission, and goals of the university
- Prepare and share status update logs and documentation on Outreach and Branding with the Vice-Chancellor and key management officials

I) Estate Manager: The main responsibilities of the Estate manager include:

- Maintenance and upkeep of the university buildings including residential quarters, student hostels and guest house
- Ensuring clean and green environment with necessary horticulture works and maintaining the same
- Providing necessary physical arrangements during training programmes, seminars and workshops of the University
- Supervise implementation of annual maintenance contracts
- Procurement of materials in connection with the maintenance works and supervise proper usage of the materials procured

J) Dean of Schools: The main functions and responsibilities of each Dean of the Schools shall be to:

- Implementing the vision and mission of the university in their respective schools
- Plan the development of the school, procurement of equipment, furnishing of labs, designing and supervising session plans, overseeing student activities and general upkeep of the department
- Assign duties to teaching and non-teaching staff of the school
- Prepare the budget/requirement to present to the Vice-Chancellor
- Motivate faculty towards industry research projects and utilizing funds from various research funding agencies including the national and state government

K) Librarian: The librarian shall be responsible for the:

- General administration of the library
- Development, modernization, upkeep and management of the University Library
- Custodian of all books, periodicals, journals and library equipment and shall ensure that no irregularities take place and that no collaterals are lost
- Planning of the budget for purchase of books, selecting books as per requirement and budgeting and sharing purchase order for books to Administration team

L) Director – Partnership and Alliances: The main functions of the Director shall be to**:**

- Develop and implement a partnership strategy ensuring the best of relationships with other universities, alumni, industries and other donors
- Develop strategic partnership-building approaches with government, donor, civil society, corporates and alumni
- Ensuring cordial relationships with key government funding partners, philanthropic organizations, industries and alumni
- Support, guide and train the university staff in forging new and maintaining existing alliances
- Maintain an exhaustive database of information relating to partners and donors
- Facilitate strategic engagement with relevant national and international stakeholders
- Develop and manage Memorandum of Understanding and contracts

M) Mobilization and Placement Officer: The key roles and responsibilities shall be to:

- Undertake awareness cum mobilization activities for student sourcing
- Organize industry visits for the students for ‘On the Job’ training
- Maintain repository of students enrolled, trained, graduated and placed
- Provide structure advice and counselling to students enrolled for future pathways
- Appraise the student of any job opportunities available, arrange campus interviews, and interviews at offices of different industries for training and placement

N) Gender, Social Inclusion and Environment Safeguards Expert: The key roles and responsibilities shall be to:

- Provide targeted advisory support for the development and integration of gender and social aspects in the functioning of the University and its policies
- Strengthen multiple stakeholder's constitutional knowledge on women rights and gender issues
- Implement gender, diversity and social inclusion capacity development initiatives
- Contribute to produce resource materials addressing gender and social inclusion equality

O) Head-Legal and Ethics: The Head of the Legal and Ethics office shall be responsible to:

- Legal counsel and guidance to the nodal officers of the University and other management personnel on all legal matters relevant to a large public educational institution
- Draft, review and approve policies, procedures, regulations and other legal documents in accordance with the Bylaws
- Review and prepare both written and oral opinions on a wide variety of legal issues
- Represent or oversee the representation of the University and other management officials in judicial and administrative proceedings
- Provide training to the campus community on various legal issues through seminars and conferences

P) Student Counselling Officer: The key responsibilities of the Student Affairs Officer shall be to:

- Provide individual or group counselling support to students on a range of educational, personal issues or any other issues
- Act an as advisor to students on issues related to emotional aspects of learning and student welfare
- Assist students with equity and welfare issues that may be affecting their ability to study and adjust with peers
- Provide crisis intervention to them based on the psychological needs of the student
- Direct the students to resolve their immediate concerns and instill skills for dealing with future issues

7. International and National Best Practice Overview

Both Indian and international education and skilling ecosystem is maturing with a plethora of initiatives and schemes and also offer vast array of VET options in the form of institutes/colleges/universities specially designated for the purpose of skilling every segment of population with career progression clearly defined. While the institutes differ in terms of their skilling model and strategies, key outcomes that these institutes aim to achieve are similar. These are: understanding of the specific skills required by the job market, bridging the industry-academia gap, increase in uptake of skilling courses/trades, promoting innovations and R&D, building pool of entrepreneurs, enable remote learning/online based learning, equipping the trainees with market relevant skills to make them job ready and work on lines of their country's TVET policy and objectives.

The best practices resulting from shortlisted national (including Assam based institutions) and international institutions and advanced States in India have been charted below across various parameters which served as an input while arriving at recommendations and from which ASU can draw learnings. Some additional detailed best practices have been delved in detail as a part of various workstreams of the project in different sections of the report.

7.1. Best Practices in case of advanced States in India

In order to arrive at the list of advanced states in the country which would be considered for deep dive, a rationale/ framework was developed (as shown in the exhibit below) taking cognizance of about six parameters.

Table 22: Parameters considered for shortlisting states

Parameters	Economy	Demographics	Start-up ecosystem	R&D and innovation	Employability	Skilling ecosystem
Gujarat	• Among top 5 states in terms of contribution to GDP (7.6%) • State GSDP growth rate higher than the national average over the past decade	• Literacy rate (78%), LFPR (54%) and WPR (51%) higher than national average	• Best performer in state ranking of Startup ecosystem. • First to implement Student Startup and Innovation Policy	• It has over 35 R&D and specialized institutions with focus on applied research for major manufacturing sectors	• Among top 3 states where maximum hiring activity takes place	• Has many skilling institutions which have taken innovative approaches towards skilling • Most govt. skilling budget directed towards improving skillset at grassroot level communities
Karnataka	• Among top 5 states in terms of contribution to GDP (7.9%) • State GSDP growth rate higher than the national average over the past decade	• Literacy rate (75%), LFPR (56%) and WPR (53%) higher than national average	• Among top performer • First state to come up with a dedicated Startup Cell	• Most innovative state in India based on India Innovation Index 2019. • Houses many premier R&D institutions under Karnataka State Council for Science and Technology	• Among top 3 states where maximum hiring activity takes place	• Has many skilling institutions which have taken innovative approaches towards skilling • Most govt. skilling budget directed towards improving infrastructural facilities
Kerala	• GDP contribution of 4.11% makes Kerala the 11th top GDP contributor of India.	• Literacy rate (93.5%) and LFPR (53.6%) higher than national average	• Among top performer • Formulated Kerala Technology Startup Policy to become culture of entrepreneurship among youth.	• There are over 27 R&D centres in Kerala. • Ranked 6th on India Innovation Index 2019.	• Among top 10 states who made it to the employability list.	• Most govt. skilling budget directed towards skilling the youth

Source: India Skills Report 2019, State Startup Ranking 2018, https://pib.gov.in/newsite/PrintRelease.aspx?relid=193852#:~:text=Karnataka%20is%20the%20most%20innovative,in%20southern%20and%20western%20India, Annual PLFS Report 2017-18, SSDMs website

The first obvious parameter was to look at the state's economic (i.e. their contribution to the country's GDP and trend of GSDP growth rate) and demographic (literacy rate, Worker population ratio, Labor force participation rate) performance. Further, the government launched the Startup India initiative in the year 2016 to nurture a strong ecosystem of innovation and entrepreneurship in the country with the vision of making India a country of job creators instead of job seekers.

The govt. releases the state wise Startup ranking on an annual basis which was another important parameter for shortlisting advanced states. In addition, to create synergies between different stakeholders in the innovation ecosystem, NITI Aayog in partnership with Institute for Competitiveness released the India Innovation Index (III) 2019 which was considered as another critical parameter. To bring out a holistic picture of state wise analysis, their overall skills, entrepreneurship and employability ecosystem was studied. Thus, post considering the abovementioned parameters, a list of 3 advanced states-Gujarat, Karnataka and Kerala was finalized. State-wise analysis is presented in subsequent sub-sections of the report.

7.1.1. Gujarat

Overall skills and entrepreneurship ecosystem

By the government initiative, 17,86,797 youth have been provided employment through Employment Exchanges in the last five years. The construction work of Indian Institute of Skills at NASMED, Gandhinagar has also started on 20-acre land for industrial demand-based world class skill development[186]. It is expected that employment opportunities of the state's youth will increase by this initiative.

- **Highlights of skilling & entrepreneurship budget**: A provision of INR 92 cr. has been allocated for recruitment of one lakh apprentices under Mukhya Mantri Apprenticeship Yojana. Further, to impart skill training to ~70,000 youth under PMKVY and other skill development schemes, INR 50 cr. have been assigned to through Gujarat Skill Development Mission. Interestingly, the state lays immense focus on providing infrastructure facilities like ITI, new buildings, workshop, theory room and construction of staff quarters and to equip them with latest equipment. Moreover, subsidy is allocated to ~1,20,000 construction workers of Ahmedabad, Surat, Vadodara and Rajkot for travelling expense incurred for commuting to Kadianaka and work place by City Bus[187].
- **Policies for skill development and entrepreneurship**: The state boasts of many innovative policies to propel its skilling and entrepreneurship landscape such as Gujarat Biotech Policy[188] which promotes the biotechnology sector while also creating entrepreneurial opportunities in the sector. It also focuses on R&D in the field of biotechnology. Its Gujarat Science, Technology and Innovation (STI) Policy[189] incentivizes start-ups with an aim to evolve solutions to complex issues of the public sector, which otherwise are difficult to implement in the public sector. Recently, the state introduced Gujarat Student Startup And Innovation Policy (SSIP), 2017 to create a state-wide, integrated and university-based innovation ecosystem to support innovations and ideas of young students[190].
- **Prominent institutions**: Gujarat is known for its vibrant skilling and entrepreneurship institute base. Skill Development Institute Ahmedabad focusses on holistic interventions in vocational skill development for tribal and unemployed youth and transforming them into "Day 1 Job ready Professionals"[191]. The state also has Entrepreneurship Development Institute of India which offers PG Diploma in Innovation, Entrepreneurship and Venture Development[192]. It also houses one of

[186] Gujarat Budget for 2020 towards skill development
[187] https://invest-india-revamp-static-files.s3.ap-south-1.amazonaws.com/s3fs-public/2020-02/Budget%20Gujarat%202020.pdf
[188] https://btm.gujarat.gov.in/images/pdf/Crisp-Presentation-on-BT-Policy.pdf
[189] https://dst.gujarat.gov.in/startup-policy.htm
[190] https://www.startupgujarat.in/writereaddata/Images/pdf/Student-innov-Policy-HT-Edu.pdf
[191] https://www.sdiahmedabad.in/about.html
[192] https://www.ediindia.org/

the first skill university to be established in PPP mode in the country, i.e. TeamLease Skills University which offers a gamut of programmes/courses[193].

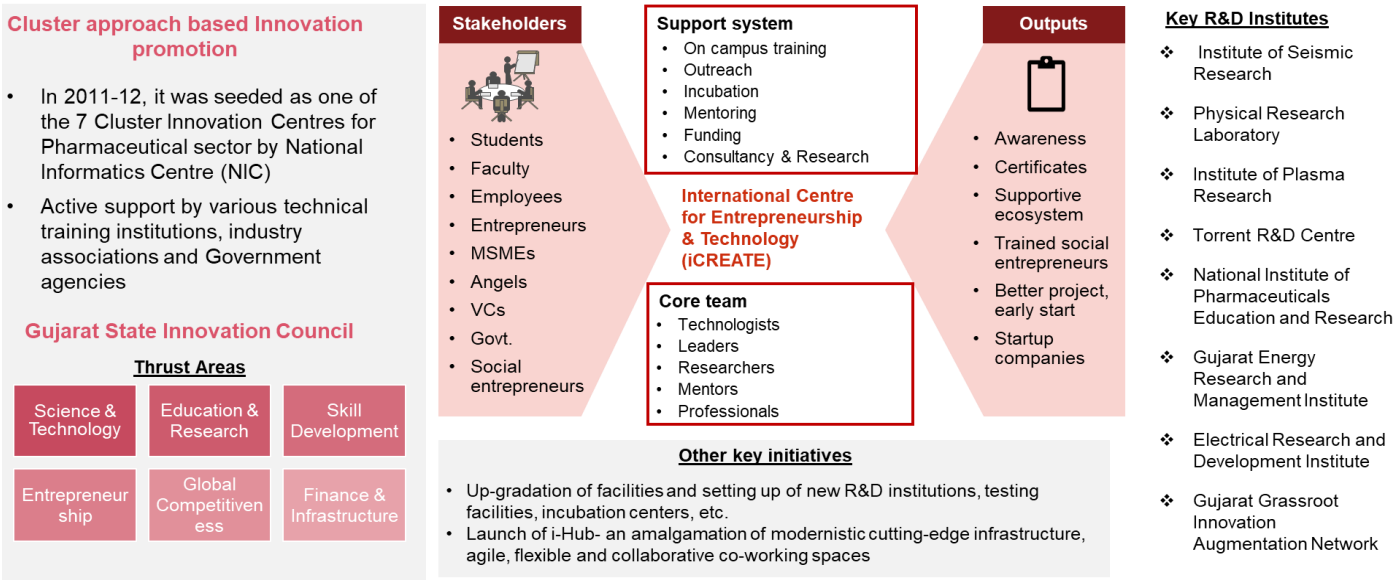
- **Venture funding support**: The state has a very active investor community comprising of various investing organisations such as the Gujarat Venture Finance Limited[194] (GVFL), the Gujarat Angel Investors Network[195] (GAIN) and individual angel investors.
- **Subsidized incubation**: Under the Startup & Innovation Policy, subsidy is provided to eligible start-ups is in the form of sustenance allowance (seed funding). The subsidy may be utilised for paying the incubation fees (if any) to the nodal institute (NI) to avail a subsidised incubation. It has also been mandated that all the institutes/universities receiving grants under the Student Startup and Innovation Policy (SSIP) 2017 must provide "Free Incubation Support" to the start-ups/ students for at least three months from the date of enrolment of Startup/student with the institute[196].
- **Innovative practices**: Industrial Kaushal Vikas Kendras (iKVKs) was launched in 2014 with the mission of skilling "in industry by industry for industry" – akin to apprenticeships (but shorter duration of training). Centers are set up by industry/company using their own infrastructure and training equipment[197].

R&D and Innovation

Gujarat has over 35 R&D and specialized institutions with focus on applied research for major manufacturing sectors including pharmaceuticals & biotechnology, chemicals & petrochemicals, auto & engineering, renewable energy, etc. The state has also set-up the International Centre for Entrepreneurship & Technology[198] (iCREATE) to promote innovation. Gujarat attracted maximum foreign technology transfer agreements from 1991 to 2011, giving further boost to research and development. In addition, it houses nearly 40% of the country's Contract Research Organizations in the country and some of the key R&D segments include clinical research, genetic engineering, drug research and development. The state's R&D and innovation journey began in the year 2011 when it was seeded as one of the 7 Cluster Innovation Centres (CICs) for Pharmaceutical sector by National Informatics Centre which is receiving active support from various technical training institutions, industry associations and Government agencies[199]. The exhibit below presents a summary of the state's overall R&D and innovation ecosystem:

[193] http://www.teamleaseuniversity.ac.in/
[194] http://www.gvfl.com/
[195] https://pitchbook.com/profiles/investor/112797-19
[196] https://www.startupgujarat.in/writereaddata/Images/pdf/Student-innov-Policy-HT-Edu.pdf
[197] https://documents1.worldbank.org/curated/en/774351468180260414/text/105076-REVISED-Report-No-85-4-states-Report-Skills-Development-Report.txt
[198] https://www.icreate.org.in/
[199] Innovation and R&D: Vibrant Gujarat 2017

Figure 39: Overview of Gujarat's R&D and Innovation ecosystem



Source: Innovation and R&D: Vibrant Gujarat 2017, https://icreate.org.in/

7.1.2. Karnataka

Overall skills and entrepreneurship ecosystem

The focus is on providing vocational training to fresh entrants by fully utilising the potential of the existing formal vocational training institutions and enhancing their quality and market relevance, effective demand creating and delivery. The state's skill development is on introducing broad based fundamental skill courses such as life (soft) skills, enhancing language (communication) skills, numeric and business accounting skills, computer skills even at the high school level through PPP mode[200].

- **Highlights of skilling & entrepreneurship budget**: A provision of INR 90 cr. has been allocated for Chief Minister Koushalya Karnataka Yojana to impart industrial training to 70,000 new candidates, while INR 37.5 Cr. has been set aside for upgrading the skills of 25,000 women from the SC & ST communities. Further, to boost interpersonal skills and equip the state's youth with multi-lingual skills, language skill training schools will be set-up at a cost of INR 2 Cr in Bengaluru, Mysuru, Belgavi and Kalaburagi. In addition, INR 2 Cr has been allocated for professional skill development programmes in pre-university colleges to impart vocational training. Interestingly, under govt.'s 'Guruchetana' initiative 1 lakh school teachers will be given training to improve their skillsets through a 10-day capacity building programmes[201].
- **Policies for skill development and entrepreneurship**: The state boasts of many innovative policies to propel its skilling and entrepreneurship landscape such as i4 Policy- IT, ITES, Innovation Incentives Policy which provides IT companies with land with respect to the number of jobs they create. It also provides them with single window clearance, exemption from Karnataka Industrial Employment rules, etc[202]. The state's Startup Policy focuses on creating New Age Incubation Network, Fostering strong partnerships between R&D institutions and Industry, Providing early stage/Idea2PoC (Proof of Concept) funding, Networking and Aggregation of Common Instrumentation Facilities and Creating Incubation infrastructure through PPP[203].

[200] https://www.kaushalkar.com/wp-content/uploads/2019/04/Karnataka-Skill-development-policy.pdf
[201] Karnataka Budget for 2020 towards skill development
[202] http://registration.k-tech.org/docs/i4-policy.pdf
[203] https://startup.karnataka.gov.in/docs/Startup_Policy_Karnataka.pdf

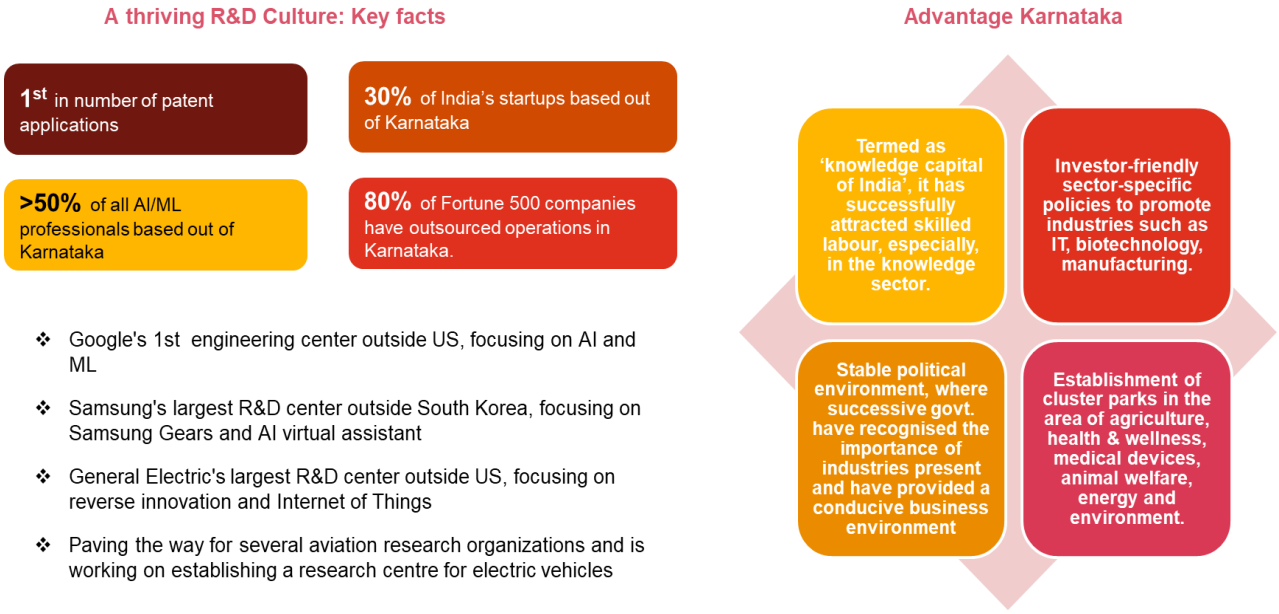
- **Prominent institutions**: Karnataka has numerous Intellectual property facilitation and support centres for start-ups such as Visvesvaraya Trade Promotion Centre (VTPC), Department of Industries & Commerce, Patent Information Centre (PIC), Karnataka State Council for Science & Technology (KSCST). Some of the educational institutes promoting entrepreneurship include Indian Institute of Management (NSRCEL), Xavier Institute of Management & Entrepreneurship, Centre for Entrepreneurship Development of Karnataka. In addition, the state is recognised for Karnataka German Technical Training Institute established with technical support of GIZ InS. . All the programs offered by KGTTI follow German vocational education and training standards that are demand oriented due to their close relationship with industry[204].
- **Innovative practices**: Department of Employment and Training (DET) has several industry partners supporting Government ITIs under CSR. For example, Bosch Ltd runs bridge program in 25 ITI's, Toyota Ltd (10 ITIs), Maruti Suzuki (5), many more industry partners[205]. The state govt.'s Department of Information Technology, Biotechnology and Science &Technology launched a programme in 2019 to empower student start-ups in the state towards entrepreneurship. E-Step focuses on boot camps, mentoring and training programmes which cover various aspects of entrepreneurship[206].

R&D and Innovation

Karnataka is recognized as a Knowledge, research and innovation hub of Asia, with over 400 high-end R&D centres and has an outstanding ecosystem for promoting ease of doing business. Since Bengaluru is recognized as the Silicon Valley of India, the state's R&D and Innovation milieu has been ahead of times. Karnataka, especially Bengaluru has emerged as R&D services leader across the country in various verticals such as telecom, semiconductor, consumer electronics, computer peripherals, aerospace, software and internet. It will continue to the most preferred destination in India for MNCs due to its overall ecosystem and the highly qualified and skilled resource pool. Karnataka has also been ranked among the world's top 15 Startup ecosystems and is also recognized as one of the second fastest growing start-up ecosystem. Interestingly, the state was the first in the country to come up with a multi-sector Startup policy and currently comprises for more than 4000 start-ups[207]. The state also boasts of a vibrant industrial base consisting of automobile, agriculture, aerospace, textile & garment, biotech and heavy engineering industries. It has also established sector-specific SEZs for some of the thrust industries such as IT, biotechnology, engineering, food processing and aerospace. The exhibit below presents a summary of the state's overall R&D and innovation ecosystem:

[204] http://kgtti.com/
[205] https://karunadu.karnataka.gov.in/jnanaayoga/Other%20Reports/KjaRecommendationSkillDevelopment.pdf
[206] https://www.thehindubusinessline.com/news/education/karnataka-launches-e-step-to-empower-student-start-ups/article29035479.ece
[207] Towards making Bengaluru the R&D capital of India

Figure 40: Overview of Karnataka's R&D and Innovation ecosystem



Source: Towards making Bengaluru the R&D capital of India,, https://www.investindia.gov.in/state/karnataka , https://www.investkarnataka.co.in/choose-karnataka/

7.1.3. Kerala

Overall skills and entrepreneurship ecosystem

To skill the state's youth and accelerate their skills to global standards for employment in the country and abroad, the state govt. has set-up Kerala Academy for Skills Excellence (KASE) which coordinates and facilitates all skilling initiatives of Kerala. KASE was designated as the State Skill Development Mission in the year 2016 to help develop an industry-ready workforce through its unique skilling models. Many of the reputed skilling institutions in the state reach out to KASE in getting their courses accredited with the objective of enhancing their reach and acceptance while mobilizing candidates[208].

- **Highlights of skilling & entrepreneurship budget**: A provision of INR 200 cr. allocated to Kerala Development and Innovation Strategic Council (K-DISC) to take up skill training of the state's youth. Further, INR 40 cr. has been kept aside for 'Kerala Innovation Challenge' and the state govt. recently proposed the setting up of 'Startup innovation zones'. Interestingly, INR 50 cr. was allocated to provide matching funds for start-ups getting venture capital/ angel funding and INR 2,000 cr. has been earmarked for the promotion of small enterprises. Recently, the state finance minister reiterated the need for forming a 'skill mission' under the K-DISC as part of which 50 lakh educated youth will be imparted training on a war footing[209].
- **Policies for skill development and entrepreneurship**: The state boasts of many innovative policies to propel its skilling and entrepreneurship landscape such Kerala Technology Startup Policy 2014 formulated to unfold the broad framework for creation of a Startup ecosystem in technology based start-ups across sectors and is split into 9 sections that act as the strategic building blocks towards a world-class Startup ecosystem: Infrastructure, Incubators and Accelerators, Human Capital Development, Funding, State Support, Governance, Public Private Partnership, scaling existing and establishing new Incubators and Startup-Bootup-Scaleup model for moving fast from

[208] http://www.kase.in/
[209] https://www.thehindu.com/news/national/kerala/kerala-budget-january-15-2021-issac-thomas-live/article33577359.ece

ideas to IPO[210]. In the year 2017, Kerala Startup Mission formulated the 'Technology Innovation and Entrepreneurship policy for fostering the growth of entrepreneurial ecosystems[211].

- **Prominent institutions**: Kerala has numerous skilling and entrepreneurship institutes such as Kerala Institute for Entrepreneurship Development, Skill Development Institute (SDI) Kochi, Community Skills Park (CSP) established as part of Additional Skill Acquisition Programme (ASAP). CSPs are envisioned to be advanced hubs for skill development at par with international standards which shall result in readily employable, skilled human resources. Each CSP will act as a hub for multi-skill development, through active linkages with technical institutions, training facilities, and industries within its geography[212].
- **Startup funding**: Kerala Startup Mission offers numerous funding avenues to its start-ups such as grants for innovative ideas (Rs 2 lakhs per idea), seed funding (pre commercialization), standard investment subsidy is available for start-ups at 30% of fixed capital investment, early stage funding, etc[213].
- **Key initiatives/support areas**: To improve entrepreneur talents during incubation period, Youth Entrepreneurship Development Programme (YEDP) comprise of programmes and schemes like 'Learn to Code', Startup Box Campaign, Startup boot Camp, Leadership Academy & Training Programmes, International Exchange Programme, Fablab Programme, Patent Support Scheme and Entrepreneur Driving Programme. The state Startup mission also provides marketing support to start-ups and organises various mentorship/connect sessions[214].
- **Innovative practices**: KASE has launched an international outreach initiative - iSTEP (International Skill Training and Employability Programme) for faster, simpler and efficient processing required for setting up of Centres of Excellence (CoE) in various sectors. Other skill development initiatives from KASE include Kaushal Kendras, Employability Centres, Career Development Centres, PMKVY, etc[215].

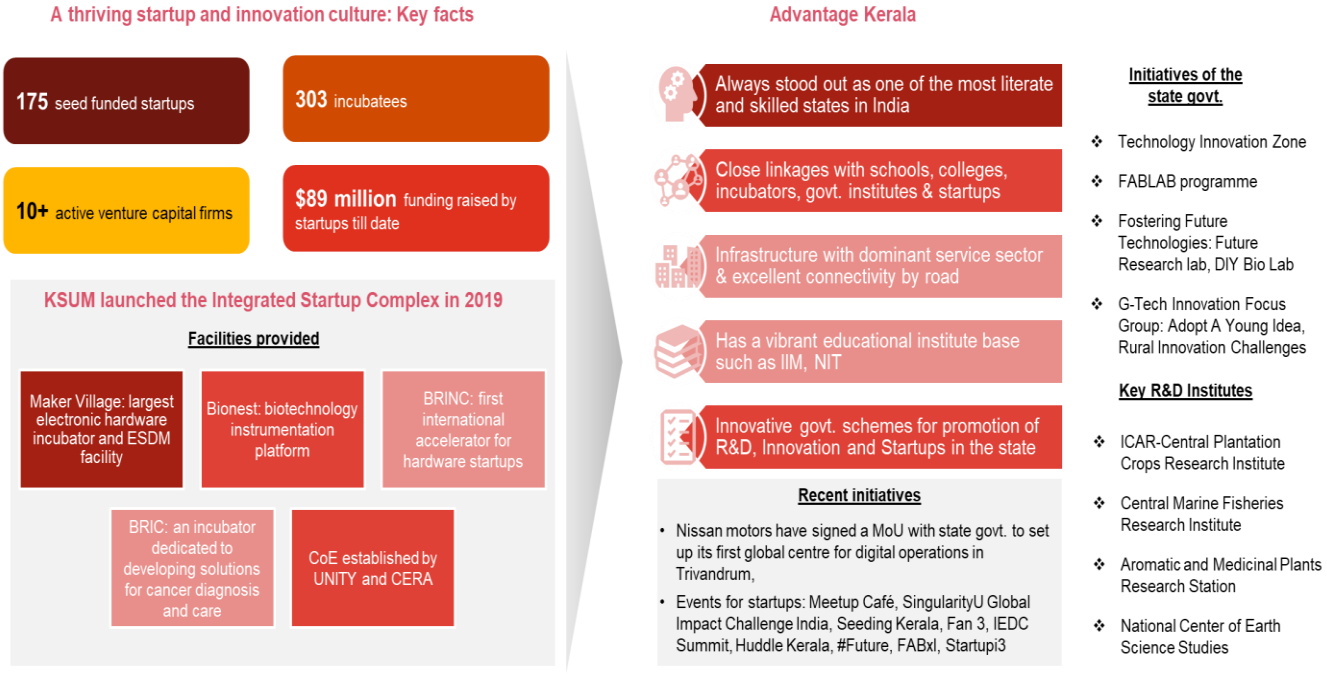
R&D, Start-ups and Innovation

Kerala has been considered as a pioneer state in terms of various hardware and product-focussed start-ups and developing solutions in newer and better ways owing to its host of support systems and infrastructure created to nurture futuristic technologies. With over 2200 start-ups as on January 2019 (35% increase compared to 2018) already in existence, many young and bidding entrepreneurs are moving to Kerala to kick-start their ventures. The state govt. has a network of 230 Innovation & Entrepreneurship Development Centre (IEDC) cells in professional colleges and through these mini incubators it enable students to work on prototypes while studying. In addition, the state is home to over 35 incubators, 5+ accelerators, and 11+ coworking spaces. Recently, KSUM launched the Integrated Startup Complex in Kochi for various tech sectors[216]. The exhibit below presents a summary of the state's overall Startup, R&D and innovation ecosystem:

[210] https://jecc.ac.in/documents/Kerala_Technology_Startup_Policy.pdf
[211] https://www.startupindia.gov.in/content/dam/invest-india/Templates/public/Kerala%20Startup%20Policy%202017.pdf
[212] https://skillparkkerala.in/
[213] https://startupmission.kerala.gov.in

[214] Kerala Startup Mission
[215] https://kase.in/why-kase
[216] https://inc42.com/datalab/kerala-startup-ecosystem-report-2019-how-kerala-nurtures-innovation-to-support-over-2200-startups-in-the-state/

Figure 41: Overview of Kerala's Startup, R&D and Innovation ecosystem

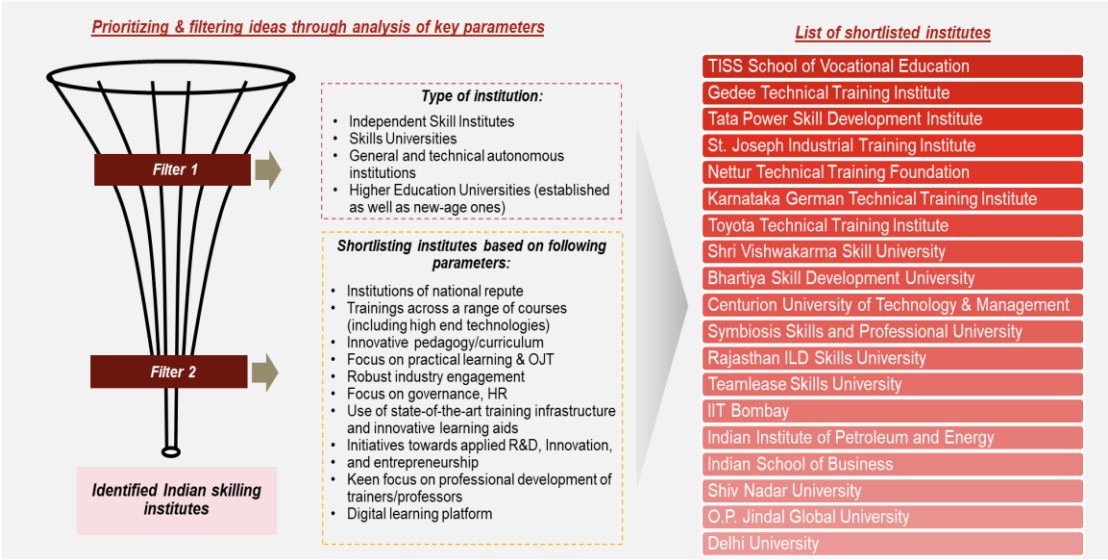


Source: Kerala Startup Policy, https://inc42.com/datalab/kerala-startup-ecosystem-report-2019-how-kerala-nurtures-innovation-to-support-over-2200-startups-in-the-state/, Kerala Startup Mission dashboard

7.1.4. Best Practices in case of Indian skilling institutes

In addition to advanced states, numerous other institutes of national repute were studied to holistically understand their best practices throughout the training lifecycle. In order to arrive at the list of institutes which would be considered for deep dive, a two-step filtering criterion was adopted as shown in the exhibit below:

Figure 42: Rationale for shortlisting Indian Institutes



For shortlisting Indian institutes, as the first filter, types of institutes that exist in the country were analyzed, i.e. independent skilling institutes, skill universities, general and technical autonomous institutions and higher education universities. The second filtering criteria was based on shortlisting TVET institutes among abovementioned institutes/universities type. To freeze the list of institutes,

numerous parameters such as institutes of national repute, offering trainings on high end technologies, well developed and robust infrastructure, use of state-of-the-art technologies in the institute, robust industry engagement, applied R&D, innovation, and startups ecosystem, etc. were also considered. Thus, post applying the two filters, a list 19 Indian institutes was finalized which have been delved in detail below:

- **Applied R&D and innovation:** IIT Bombay provides various innovations for society with work related to modern science and technology for developing devices, packages and strategies. It also has Tata Centre for Technology and Design established in 2014 with the aim of developing solutions for challenges faced by various communities using end to end innovation approach.[217]. Similarly, Indian Institute of Petroleum and Energy, Andhra Pradesh has signed MoUs with the University of Houston and Texas A&M University with the aim of joint research and provide students with skills and knowledge to perform in a more efficient manner in the energy industry[218]. Further, T-Hub in Andhra Pradesh leads India's pioneering innovation ecosystem that powers next-generation products and new business models[219]. Interestingly, IIM-A, Gujarat offers a program on R&D Management for leaders or managers of R&D teams/departments of private as well as public sector organizations that are engaged in R&D projects[220].
- **Entrepreneurship/Start-Ups:** Several Skill universities offer B.Voc and M.Voc in Entrepreneurship development. For instance, Shri Vishwakarma Skills University, Haryana offers M.Voc. in Entrepreneurship in partnership with Shri Guru Nanak Develop Center of Innovative leadership and entrepreneurship[221]. While Bhartiya Skill Development University, Rajasthan offers B. Voc, M. Voc and Ph.D. in entrepreneurship skills[222], TISS School of Vocational Education in Maharashtra offers Masters in Livelihoods and Social Entrepreneurship[223]. Further, colleges such as IIT-B, ISB Hyderabad and OP Jindal Global University also have an Entrepreneurship Cell. It is noteworthy that Entrepreneurship Development Institute of India, Gujarat has helped set up 12 state-level exclusive Entrepreneurship Development Centres and Institutes and has also established a Centre for Research in Entrepreneurship Education and Development (CREED)[224].
- **Industry-Institute engagement:** Indian institutes and universities such as IIT Bombay[225], SVSU[226], BSDU[227], ISB Hyderabad[228], St. Joseph ITI in Maharashtra partner with industries not just for students placements but also organise industry exposure visits and guest lectures for their students to acquaint them with real world working environment and motivate them. Further, their faculty members offer Research and Consultancy services to the industries based on their expertise. In addition, these universities and institutions offer corporate trainings for employees with focus on reskilling and upskilling through special short-term trainings. TeamLease Skills University through its Enterprise Learning Services delivers soft skills, leadership training & executive coaching to corporate clients and individuals[229].

Current practices in Training model

A streamlined approach towards skilling requires a well-defined training model with effective strategies for mobilizing candidates, selection and admission process, counselling and other support services for the trainees, designing the course curriculum, assessment and certification process, etc.

[217] https://www.iitb.ac.in/
[218] https://www.iipe.ac.in/
[219] https://t-hub.co/
[220] https://web.iima.ac.in/exed/Executive-Education/uploads/broucher/468/TVuz.pdf
[221] https://www.svsu.ac.in/
[222] https://ruj-bsdu.in/
[223] https://admissions.tiss.edu/view/10/admissions/ma-admissions/m-a-social-work-in-livelihoods-and-social-entrepre/
[224] https://ediindia.ac.in/overview-and-emergence-of-edii/#:~:text=To%20pursue%20its%20mission%2C%20EDII,Entrepreneurship%20Development%20Centres%20and%20Institutes.&text=of%20India%20assigned%20to%20EDII,Myanmar%20and%20Vietnam%20and%20Uzbekistan.
[225] https://www.iitb.ac.in/
[226] https://www.svsu.ac.in/
[227] https://ruj-bsdu.in/
[228] https://www.isb.edu/en.html
[229] http://www.teamleaseuniversity.ac.in/enterprise-learning-services.php

- **Student mobilization and counselling**: Higher education as well as skilling institutions in India (such as Nettur Technical Training Foundation (NTTF)[230], **Shri Vishwakarma Skill University**[231], **Tata Power Skill Development Institute**[232], **several ITIs)** tend to advertise opening of admissions through their social media channels, print media, posters in relevant schools, etc. **TISS School of Vocational Education**[233], due to its hub and spoke model outsources mobilization primarily to its hubs. In terms of counselling, they have designed a 'Vocational Aptitude System' to help students to understand their aptitude and select an appropriate course. **Pre-admission counselling is a standard process in most reputed engineering institutions such as the IITs**[234], **NIIT**[235], **IIIT,** as well as in skill development institutions as mandated. Institutions such as Ashoka University[236], OP Jindal Global University[237] also have open houses both on campus and digitally (especially in times of COVID-19).
- **Course, curriculum and pedagogy**: Employers /industries /industry bodies are the focal point while designing the curriculum across all studied institutes to ensure that students are equipped with market relevant skills. Institutions such as Toyota Technical Training Institute[238] (TTTI), Gedee Technical Training Institute[239] (GTTI), Karnataka German Technical Training Institute[240] (KGTTI), IIT-B, ISB, SVSU, Centurion University of Technology and Management[241] (CUTM), etc. have technical training embedded in a student centric approach with focus on knowledge, skill and body & mind with state-of-the-art facility. Similarly, NTTF[242], GTTI also lays focus on soft skills as well as on Six Sigma, 5S training to the students. Moreover, School of Vocational Education (SVE)[243] develops its own curriculum and that is first vetted and approved by COE members, then by the school board and finally by the academic council before rolling out.
- **Trainings with focus on OJT and practical learning**: SVSU is developing an Integrated Dual Education Model that enables students to "earn-while-learn" and provides an opportunity to enhance their qualification. 60% of the credits are earned while working on OJT and the rest 40% comes from the theoretical and conceptual training[244]. However, KGTTI has a reverse approach to traditional training models with 80% weightage given to practical training[245]. Students at TTTI are exposed to 400 hrs on the job training in production line at Toyota Kirloskar Motor[246].
- **Industry-sponsored training**: SVSU, GGTI, BSDU are inspired by the dual training system. Others have some or the other form of industry led trainings such as in PPP mode, CoEs, industry sponsored trainings, joint certifications, etc. For e.g.: in SVSU important industries like automobile, auto components, electronics, IT & ITeS, BFSI, etc. which use advanced technology and absorb skilled manpower offer campus-industry training programmes[247].
- **Hub and spoke model:** TISS-SVE has established 100+ hubs across India that undertake training. They are supported by centrally developed curriculum, pedagogy, assessment methodologies, etc. as well as strong industry collaborations[248]. SVSU also aims to adopt hub and spoke training model in the major industrial clusters/ Special Economic Zones and backward areas of the state to deliver

[230] https://www.nttftrg.com/
[231] https://svsu.ac.in/
[232] https://www.tpsdi.com/
[233] https://www.sve.tiss.edu/
[234] http://iitb.ac.in/
[235] https://www.niit.com/india/
[236] https://www.ashoka.edu.in/
[237] https://jgu.edu.in/
[238] https://www.toyotabharat.com/toyota-in-india/ttti/
[239] https://www.gttiinfo.com/
[240] http://kgtti.com/
[241] https://cutm.ac.in/
[242] https://www.nttftrg.com/
[243] https://sve.tiss.edu/
[244] SVSU Prospectus 2020
[245] http://kgtti.com/
[246] https://www.toyotabharat.com/documents/environment/sustain-report/2013/sustainability_report13_fe.pdf
[247] https://www.svsu.ac.in/wp-content/uploads/2019/05/Draft-Prospectus-2019-20_V1.pdf
[248] https://sve.tiss.edu/index.php?p=training-partners-hub

industry-specific skills training[249]. In addition, CUTM offers a training cum production facility for the RMG sector that is equipped with CAD/CAM lab[250].

- **Assessments**: Indian skill development institutions that are implementing QP based training tend to undertake summative assessments such as mock tests and the final assessment. Institutes like GTTI, KGTTI undertake formative assessments such as periodic internal assessments (formative) through the course of the training programme. SVSU also has a programme for weak students where they are closely mentored, counselled and supported to improve their performance[251]. For non-QP based trainings, institutions such as NTTF have MoUs with partners to undertake assessments[252].

Other aspects of the training process

- **Placements**: Higher education as well as skilling institutions (such as SVSU, BSDU, ISB Hyderabad, IIT Bombay, OP Jindal Global University, Indian Institute of Petroleum and Energy (IIPE)) have a dedicated placement cell to facilitate placement for students through strategic MoUs with industries and industry bodies. In addition, for the purpose of pre-placement counselling and necessary support, institutes have a 'Career Development Centre'. This centre organises soft skills workshops, career guidance sessions, designs campus placement preparation module, conducts various mock interviews, GD, CV workshops, etc.
- **Trainers**: All studied national institutes continuously engage with industrial and institutional partners for professional development of their trainers and enhancing their technical knowledge base. For e.g.: IIT Bombay mandates that its faculty members spend on an average 30% of their time on teaching, 20% on service-related activities and 50% on research[253]. Similarly, ISB Hyderabad through its Centre for Learning and Management Practice develops teaching expertise of faculties of various business schools[254].
- **Focus on future skills:** SVSU has signed an MoU with the Haryana government's start-up innovation hub to train students in AI, use of robotics, 3-D printing techniques and cyber security, among other such "new-age tech" courses[255]. Similarly, KGTTI has partnered with Labtech International for innovative and interactive digital learning content for selected TVET subjects[256].
- **Inclusivity in training:** SVSU started a batch for women with HeroMotoCop in Delhi in 2019 to create the pull factor for women in the automotive industry[257]. TPSDI has also introduced 'Skills on Wheels' which is a mobile concept to make its trainings more accessible to people. The mobile centre provides recognition of prior learnings, training for local electricians etc[258].
- **Institutional partnerships**: Institutes and universities such as CUTM, ISB Hyderabad, IIT Bombay, SNU, DU, TeamLease Skills University, etc. have forged partnership with many international institutes and universities to promote education, scientific cooperation, create mobility and exchange programmes for teachers, researchers, and students, offer joint degree programmes and enhance technological, social and cultural bondage between countries.

Organisation, Governance & HR

- The governance structure of most of the technical training institutes, technology and skill universities is quite elaborate in terms of their composition and representation from government

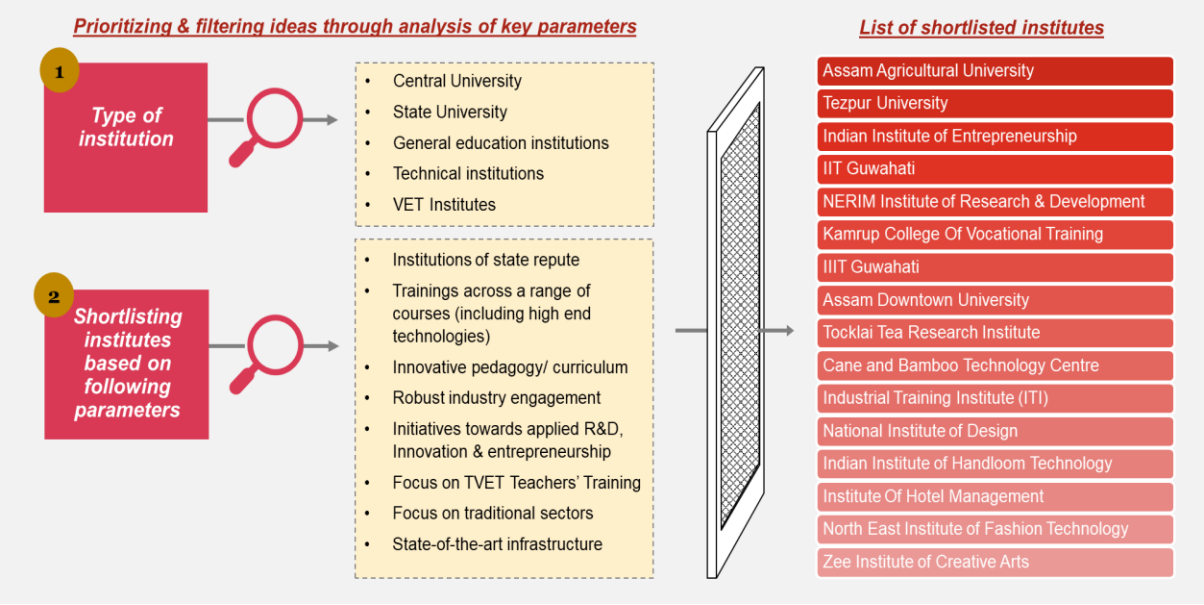
[249] SVSU Vision Document Version 2.0
[250] https://cutm.ac.in/about-us/
[251] SVSU Vision Document Version 2.0
[252] https://www.nttftrg.com/
[253] https://www.iitb.ac.in/sites/www.iitb.ac.in/files/Faculty-Handbook-2014.pdf
[254] https://www.isb.edu/en/research-thought-leadership/research-centres-institutes/centre-for-learning-and-management-practice.html
[255] https://www.hindustantimes.com/education/gurugram-s-skill-university-to-teach-robotics-ai-3d-printing/story-8LYc7tjIFjWNz0U3W9cMaJ.html
[256] http://kgtti.com/labtech/
[257] http://delhincrnews.in/2019/03/28/gurugram-svsu-undp-organise-workshop-on-women-in-workforce/
[258] https://www.skillreporter.com/2017/02/csr/tata-power-skill-development-institute-tpsdi-inaugurated-skills-on-wheels-to-make-training-more-accessible/

agencies, academia, industries with well-defined powers and functions of bodies, councils and committees. With respect to organisation structure, SNU[259], CUTM[260], SVSU[261], CIPET[262], etc. have robust structures with hierarchical layers of management where Directors/Department Officers make most of the operational decisions. Employees are grouped with one clear supervisor responding to academic and non-academic needs of the university/institute. In addition, roles and responsibilities of all faculty and staff members are well defined either on their website or as a part of the employee handbook.

7.2. Best Practices in case of Assam based institutions

Assam has been acknowledged as an 'Emerging State' performing relatively well in two pillars namely 'Startup Policy and Implementation' and 'Simplified Regulations[263]'. Moreover, to encourage innovation and entrepreneurship, the State launched its Startup policy in 2017 with the aim of enabling at least 1,000 new start-ups across all sectors over the next 5 years and attract funding opportunities of $250 million for State-based start-ups and incubators[264]. Assam also supported marquee incubator 'Assam Business Incubation Hub' in Guwahati and organized 9 bootcamps in various education institutes to foster innovation among students[265].

In order to arrive at the list of institutes which would be considered for deep dive, a two-step filtering criterion was adopted as shown in the exhibit below:



For shortlisting Assam based institutes, as the first filter, types of institutes that exist in the state were analyzed, i.e. central and state university, general education and technical and VET institutes. The second filtering criteria was based on shortlisting institutes among abovementioned institutes/universities type. To freeze the list of institutes, numerous parameters such as institutes of state repute, offering trainings on high end technologies, well developed and robust infrastructure, robust industry engagement, initiatives towards applied R&D, innovation, and entrepreneurship, focus

[259] https://www.snu.edu.in/
[260] https://cutm.ac.in/about/university-authorities/
[261] https://www.svsu.ac.in/
[262] https://www.cipet.gov.in/our-team/our-team-organisation-chart.php
[263] **States Startup Ranking 2019**
[264] Assam Startup Policy 2017
[265] https://startup.assam.gov.in/

on traditional sectors, etc. were also considered. Thus, post applying the two filters, a list 16 Assam based institutes was finalized which have been delved in detail below:

Current practices in applied R&D, Innovation, Start-ups and Industry-Institute collaborations

- **Applied R&D and innovation**: NERIM Institute of Research and Development, affiliated to Assam Science and Technology University is taking initiatives towards promotion of R&D in the field of basic sciences[266]. IIT Guwahati has a Centre of Excellence (CoE) for Sustainable Polymers known as CoE-SusPol. Its key objective is to launch state-of-the-art research facilities and conduct research that aims to develop cost effective and scalable technologies for the making of biodegradable polymer-based end products by utilizing both petrochemical and renewable bio-feedstock. It has also set up the "NRL-CoE for Sustainable Materials" in partnership with Numaligarh Refinery Limited (NRL) with the objective of developing sustainable materials from waste and by products obtained from sectors such as the petroleum, bio-refineries and Agro-industries[267]. Further, the Indian Institute of Entrepreneurship (IIE) undertakes research and studies either on its own or on sponsored basis and provides consultancy in the field of growth and development of MSMEs across North East India and other states[268].

  Tezpur University has a dedicated R&D centre with detailed guidelines for undertaking sponsored research projects[269]. Similarly, Assam Agricultural University has a vast network to conduct research including six Regional Agricultural Research Stations (RARS) and five commodity research stations[270]. Assam Downtown University has several MoUs with national level research organisations through its Research Cell for collaborative research and has published over 350 research papers and filed patents as well. It also awards mini research grants to its faculties and houses a Central Instruments Facility to strengthen research based activities[271]. To look after the R&D needs of the Indian tea industry, Tocklai Tea Research Institute was established in Jorhat and it has extensive network of advisors to guide R&D in tea cultivation[272]. IIIT Guwahati also carried out research work on sponsored basis through its various departments in the areas of design innovation, cloud environment, smart building monitoring, etc[273].

- **Entrepreneurship/ Start-ups**: Indian Institute of Entrepreneurship (IIE), Guwahati has made significant contributions in the North East region in promoting entrepreneurship. IIE has collaborations with universities resulting in great strides being created in the region in terms of entrepreneurship education and promotion. Some of the key areas of the collaborations include, (but not limited to), faculty exchange, students' internship in entrepreneurship, action research and knowledge development. It offers advice and consultancy in the various areas of entrepreneurship, including, Enterprise planning; Enterprise Management; Enterprise Expansion, Diversification & Growth; Management Consultancy; Marketing consultancy with specialization on export and border trade[274]. IIE in association with Wadhwani Foundation has launched a 6 months online Entrepreneurship Program for existing and aspiring entrepreneurs – Startup Labs 2021. There is a two 2 days Boot Camp and a Pitching Workshop organised as part of the program[275]. IIE organises seminars and workshops to share experiences on implementation of programmes of self-employment and entrepreneurship, on current topics and awareness generation. It also organises North East Region Entrepreneurship & Startup Summit 1.0 which is aimed at offering a platform to

[266] http://nerimnirdastu.org/
[267] http://www.iitg.ac.in/coesuspol/
[268] https://msde.gov.in/en/organizations/iie#:~:text=The%20major%20activities%20of%20the%20Institute%20include%3A&text=Research%3A%20The%20Institute%20undertakes%20research,East%20India%20and%20other%20states.
[269] http://www.tezu.ernet.in/rnd/
[270] http://www.aau.ac.in/research/directorates-network
[271] https://adtu.in/research; Prospectus
[272] https://www.tocklai.org/
[273] http://iiitg.ac.in/research.php
[274] https://msde.gov.in/en/organizations/iie
[275] http://iie.gov.in/projects/details/22#:~:text=Details,-STARTUP%20LABS%202021&text=Indian%20Institute%20of%20Entrepreneurship%20(IIE,Development%20%26%20Entrepreneurship%2C%20Govt%20of%20India

promising start-ups and aspiring entrepreneurs across NER. Interestingly, as part of SFURTI, IIE is undertaking upliftment of traditional and village industries and is in the process of implementing blockchain technology (matching buyers with sellers)[276]. It is also offering a 15 days business incubation training on adventure tourism where trainees are generally young and school drop-outs[277].

Further, the 'Entrepreneurial Development Cell' of IIT Guwahati organizes IITG Entrepreneurial Summit 'UDGAM' annually. This flagship event aims at instilling and spreading the spirit of entrepreneurship among the youth of the North-East, and India in general by organising workshops, lecture and events to showcase the utmost capable entrepreneurs and start-ups of India promoting a culture of innovation and problem solving[278].

- **Industry-Institute engagement:** One of the main challenges highlighted in the State's Skill Gap Study conducted by the NSDC was the lack of industry partnerships and MoUs to impart training. However, a few institutions have partnered with industries to provide better skilling programs and ensure placements. For example, the Kamrup College of Vocational Training conducts Skill Development Programs on Office Management & Secretarial Practice which is funded by Oil India Ltd (as part of their CSR initiative)[279]. Moreover, like many skilling institutes in the country, Assam based institutions such as IIT Guwahati[280], Tezpur University[281], NIRD[282], IIIT Guwahati[283], Assam Downtown University[284], IHM[285] and IIHT[286] have partnerships with several local and national level employers/industries for students' internships and placements.

Current practices in TVET Teachers Training

The State of Assam lacks appropriate training systems for trainers and instructors. For example, although DGT MSDE mandates all ITI trainers to gain a National Craft Instructor Certificate through its National Skill Training Institutes, many instructors presently employed at ITIs in Assam do not hold NCIC. This is mostly because there is no NSTI in Assam and ITIs are mostly reluctant to refer trainers to NSTIs in other States due to trainers' shortages. Moreover, the in-service training system at NSTIs is not standardized in terms of the frequency of training, content, and number and competence of master instructors, and the capacity of NSTIs is restricted as well[287]. However, some institutions in the state have undertaken initiatives towards their trainers/instructors and faculty training and development. For example, IIE organises Trainers' Training Programme (TTP) and Faculty Development Programme for College and School Teachers, ToT on Entrepreneurship Promotion Through Design Thinking[288]. Kamrup College of Vocational Training (KCVT) facilitates frequent interactions of their trainers with experts from different fields through seminars and group discussions[289]. In addition, IIT Guwahati has signed an MoU with Rashtriya Madhyamik Shiksha Abhiyan for organising Teachers Training Camps[290] and trainers at North East Skill Centre (NESC) have undergone specialised Train the Trainer Program at Singapore delivered by resource person from ITEES[291].

Remote learning platform and Digital content development

[276] Based on consultations with IIE Director, http://iie.gov.in/iie_adm/writereaddata/upload/newsletter/IGNITE_NEWSLETTER_vol-2-25112020.pdf
[277] http://www.iie.gov.in/trainings/details/607
[278] https://udgam-iitg.in/#:~:text=UDGAM%20is%20the%20Annual%20Entrepreneurship,we've%20got%20you%20covered.
[279] https://www.kcvtghy.com/csr-activities/
[280] https://www.iitg.ac.in/
[281] http://www.tezu.ernet.in/
[282] http://nerimnirdastu.org/
[283] http://www.iiitg.ac.in/
[284] https://adtu.in/
[285] https://ihmctanghy.org.in/
[286] https://iihtguwahati.in/
[287] Final concept paper of Assam Skill University Project: ADB, Dec 2020
[288] https://msde.gov.in/en/organizations/iie
[289] https://www.kcvtghy.com/about/trainers-development/
[290] https://www.iitg.ac.in/cet/teacherstraining.html
[291] https://skillmissionassam.org/domain-skilling/north-east-skill-centre/about-north-east-skill-center

With the current pandemic and the overall situation of the country, maintaining an accessible remote learning platform would be of large benefit to all stakeholders. It has become a go-to training system as it allows everyone to pursue training programs without being physically present at the training locations. Online classes started for all the theory course in IIT Guwahati, as soon as the lockdown was declared. Instructors at IIT Guwahati deliver lectures from the Centre for Education Technology. They have also developed a new video conferencing room having the features 9+1 Nodes, Full HD video quality and is Connected via NKN[292]. Similarly, Assam Downtown University has a dedicated 'Learning Management System' called PRAN that helps in delivery of learning materials and lectures and conduct assessments virtually. The cutting edge LMS also is linked to multiple open learning courses which the students can access over and above their classroom syllabus and is powered by Amazon Web Services (AWS)[293]. Other institutes such as IHM[294], IIHT[295] used Video conferencing, Google Meet and WhatsApp to conduct virtual/online classes for students.

Some other aspects of the shortlisted institutes

- **Types of programs offered**: KCVT offers courses (having duration from 3 months to 1 year) in partnership with NCVT, SCVT[296]. IIT Guwahati offers BTech, B.Des, MA, M.Des, MTech, MSc and PhD programmes in engineering, science and humanities disciplines[297]. NIRD offers graduation degree, diploma and certificates in the field of arts, commerce and science[298]. The state's Cane and Bamboo Technology Centre provides training to artisans and entrepreneurs to ensure dissemination of new developments in the cane and bamboo sector[299]. For handloom, textile and product design and fashion technology, Assam has IIHT, NEIFT and NID offering diploma and B.Des. The state also has a dedicated Agricultural University for specialization in agriculture, veterinary, community, fisheries science, horticulture and sericulture[300]. In addition, Assam also boasts of India's first full-fledged classical and digital animation training academy, ZICA for training youth in 2D Animation, 3D Animation, Visual Effects (VFX), Gaming, Graphic Design, Web Design, Digital Marketing and Digital Photography[301].
- **Student mobilization and outreach**: While institutes such as Assam Agricultural University, National Institute of Design, Assam Downtown University, IHM, IIT-Guwahati, ITI Guwahati use their website (through news, media and events page) and social media platforms such as Facebook to reach out to prospective candidates, IIE, IHM (for its short term trainings under 'Hunar se Rozgar' Yojana) and IIHT advertise about their institutes and programs through advertisements in local newspapers, TV channels, radio ads, organising seminars and workshops and connecting with village heads/sarpanch for mobilizing students. Interestingly, Tezpur University has seen a significant increase in its number of applicants not only from India but also from countries like Philippines, South Africa, etc. since it got featured in NIRF ranking and also owing to its status of central university and education and infrastructure quality[302].
- **Trainers**: Since trainers are recruited and paid either following central or state guidelines retention of trainers is not a major issue. While most of the trainers are from the state itself, central govt. institutes like IIT, IIIT, Tezpur University, IIE, IIHT, NID have trainers belonging to states such as Kerala, Gujarat, Maharashtra, etc[303].

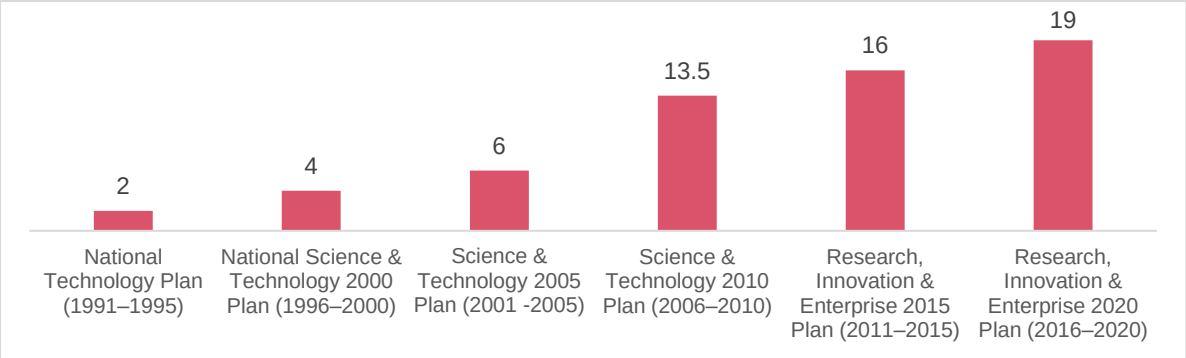
[292] https://www.iitg.ac.in/cet/
[293] https://www.eastmojo.com/news/2020/07/05/assam-down-town-university-collaborates-with-amazon-web-services-campus/
[294] https://ihmctanghy.org.in/
[295] https://iihtguwahati.in/, Based on Consultations
[296] https://www.kcvtghy.com/
[297] https://www.iitg.ac.in/
[298] http://nerimnirdastu.org/
[299] https://cbtc.org.in/
[300] http://www.aau.ac.in/
[301] https://www.zica.org/centre/guwahati
[302] Based on Consultations
[303] Based on Consultations

7.3. Vocational Education Ecosystem – An international perspective

7.3.1. Singapore: Miracle of Asia

A small country with no natural resources, limited land and capital, Singapore has emerged as one of the most developed countries in Asia (rising GDP per capita ever since its independence in 1965[304]) primarily due to its strong emphasis on investments in research and innovation and for continuously making significant investments in its human capital. It is interesting to note that over the last five decades, Knowledge and innovation have become the cornerstone of Singapore's economic development in response to Economic Review Committee Report (1986) recommending Singapore to evolve from product assembly to develop new high-technology clusters and activities. Moreover, post its independence in 1965, the government realized the immense need of building R&D and innovation capabilities to overcome the constraints of the its limited size and lack of natural resources. The government began to invest in R&D in a significant and structured way with the launch of National Technology Plan in 1991 and ever since the R&D budget has been increasingly quite significantly[305] as shown in the below exhibit:

Figure 43: Singapore R&D budget, 1991 to 2020 (in $bn)



Source: National Research Foundation, RIE2020 Plan

Currently, Research, Innovation and Enterprise 2020 Plan (RIE2020) is the country's 6th five-year plan with a 10-fold increase in the budget over the $2 billion National Technology Plan of 1991[306].

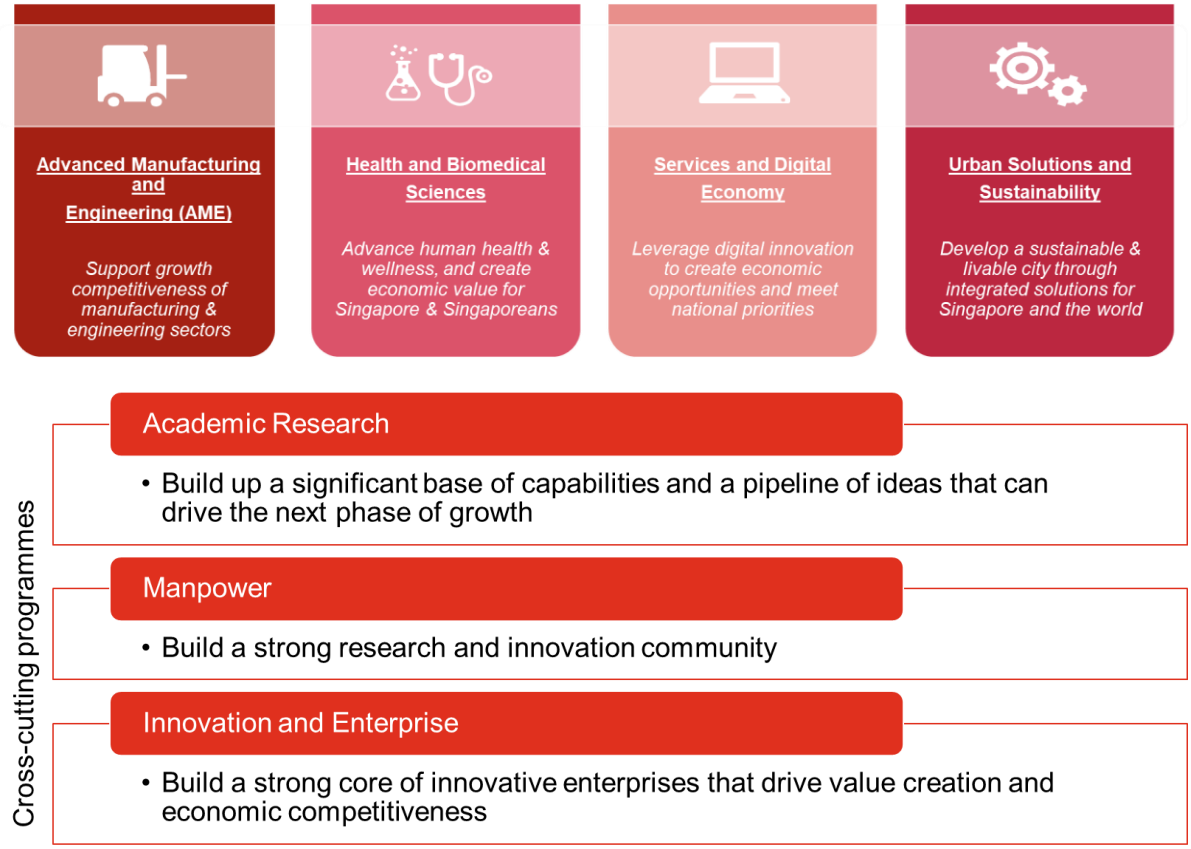
R&D ecosystem

The country has a Research Innovation and Enterprise Council (RIEC) which provides strategic direction for national R&D. In the year 2006, National Research Foundation (NRF) was formed for the purpose of extending support to RIEC through policy formulation and implementation[307]. Further, Singapore has been able to build a robust R&D ecosystem due to govt.'s commitment and steady public funding. The ecosystem comprises of research institutes of the Agency for Science, Technology and Research (A*STAR). These institutes focus on research for economic impact, academic research to develop a base of fundamental knowledge. There are numerous academic medical centres and hospitals that focus on translational and clinical research. Recently, Environmental and Water Technologies, Interactive and Digital Media have been added under the ambit of A*STAR research areas. Thus, research performers under the umbrella of Singapore's Research, Innovation & Enterprise (RIE) System include Polytechnics and Universities, Hospitals, A*STAR Research Institutes and

[304] World Bank
[305] From Research to Innovation to Enterprise: The Case of Singapore, 2016
[306] National Research Foundation, RIE2020 Plan
[307] https://www.nrf.gov.sg/about-nrf/governance/research-innovation-and-enterprise-council-(riec)

Corporate Labs. The exhibit below summarizes RIE 2020 agenda into four technology domains aligned to areas of competitive advantage and/or national needs along with some cross-cutting programmes[308]:

Figure 44: RIE 2020 focus sectors and cross-cutting programs



Source: Evolution of Singapore's Research, Innovation and Enterprise (RIE) Strategy, Dec 2019

Open innovation and talent

The country's innovation system is characterized by its welcoming nature to foreign investments, ideas, and talent. In its initial years of building R&D capabilities, Singapore heavily relied on an open talent strategy for hiring scientific leaders across the globe to seed its capabilities and mentor other young local scientists. About 30% of Singapore's research community are foreign nationals allowing it to tap into diverse set of research ideas and leverage expertise and networks around the world placing Singapore at par with Sweden and the United Kingdom which have most diverse R&D ecosystems globally. Open innovation is another critical aspect which the country is leveraging for boosting its R&D positioning. A prominent example of Singapore's open innovation strategy include collaboration of A*STAR research institutes, local companies and MNCs in the aerospace industry for building the R&D expertise needed for boosting Singapore's aerospace industry by giving it a competitive edge over other emerging hubs in the region. Recently, many of Singapore's research-intensive universities have also deepened their industry engagement with major collaborations[309].

Startup ecosystem

Singapore is regarded as a favourable hub for entrepreneurship and over the last decade, it has climbed to occupy 12th position among leading global Startup ecosystems in the world which can primarily be attributed to its robust financial and technical infrastructure, ease of doing business, technology adoption, stable political climate and supportive government policies. With respect to government

[308] Evolution of Singapore's Research, Innovation and Enterprise (RIE) Strategy, Dec 2019
[309] From Research to Innovation to Enterprise: The Case of Singapore, 2016

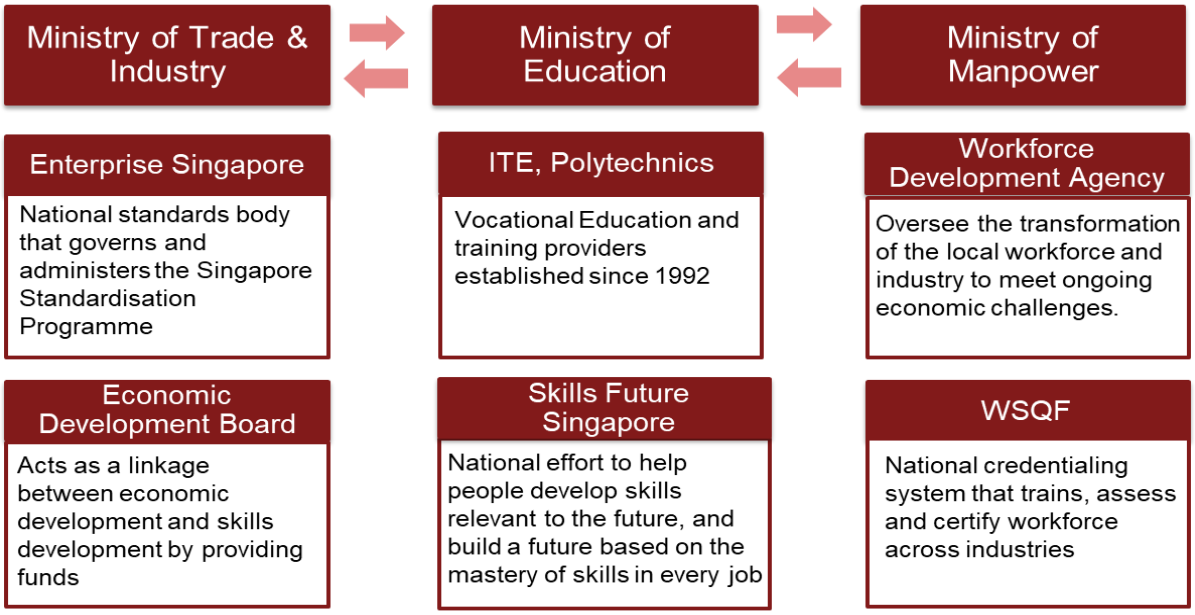
support, there are various schemes and grants focusing on different aspects of Startup growth such as improving the investment scenario, providing access to overseas markets and bringing in streamlined processes to setup businesses. There also exist several govt. supported funding bodies such as SPRING Startup Enterprise Development Scheme, the Early Stage Venture Fund Scheme, the Technology Incubation Scheme, and the Sector Specific Accelerator Program[310]. Due to the govt.'s concerted efforts, between 2005 and 2013, the number of start-ups in Singapore nearly doubled from 24,000 to 42,000, with close to 1/4th of them comprising tech start-ups[311].

In March 2017, the govt. decided to bring multiple support initiatives offered for start-ups under one umbrella through launch of Startup SG. Some of the prominent support initiatives undertaken as part of Startup SG include the Startup SG Founder which extends support to first-time entrepreneurs, Startup SG Talent for talent development for start-ups and Startup SG Equity for incentivizing equity co-investment for start-ups. Currently, under Startup SG there is a network of 3,835 start-ups, 522 investors and 215 incubators and accelerators[312]. The govt. in its 2018 budget stated that it will provide traditional SMEs with up to 70% funding to adopt off-the-shelf technologies and help them stay competitive and relevant. Moreover, Open Innovation Platform has been introduced which matches companies with ICT firms and research institutes to collaborate on developing solutions[313].

TVET ecosystem

US based Business Environment Risk Intelligence (BERI) ranked Singapore's workers as the best in the world for relative productivity. The country's policy infrastructure for human capital development is characterized by two distinct features: a tripartite approach, based on cooperation among employers, unions, and government; and a multi departmental approach involving all relevant government agencies[314]. Thus, another critical aspect propelling Singapore's growth story is its well matured and established skills ecosystem. The Skilling ecosystem in Singapore is robust with multiple govt. bodies involved and is suggestive of a strong degree of centralized articulation and planning of skills development needs as shown in below exhibit.

Figure 45: Overview of TVET ecosystem



[310] Spotlight on Singapore's Startup Ecosystem
[311] Report by BASH (Build Amazing Startups Here – a Singapore-based integrated startup space)
[312] https://www.startupsg.gov.sg/directory
[313] https://smartceo.co/spotlight-singapores-startup-ecosystem/
[314] Human Capital Development in Singapore: An Analysis of National Policy Perspectives, Aug 2004

Source: Employment and TVET-Singapore's approach

Best practices of Singapore's VET and standard development system are as follows:

- ***Programme level initiatives (Industry is the focal point across all initiatives)***
  - Continuing Education and Training (CET) Masterplan 2018: Based on recommendations of ASPIRE Committee 2014[315].
  - Thrust area: Build expertise of the country's workforce through increased involvement of employers, enabling citizens to make informed learning and career choices and develop a vibrant CET ecosystem through a gamut of high-quality learning opportunities[316]
  - Skills Future Singapore: initiative to help Singaporeans develop skills that will be relevant in future[317]
- ***Provision of Interim standards[318]***
  - Technical references (pre-Singapore Standards) are considered to be fast track documents that are developed to address urgent industry demand
  - Available for provisional application over a period of two years after which they are reviewed and are made Singapore Standards if all stakeholders agree
- ***Innovative funding models***
  - Skills Development Levy (SDL) Act enacted in 1984 requiring employers to pay a monthly SDL for all employees rendering services in Singapore, (including foreign employees and employees employed on casual, part-time, or temporary basis). SDL is payable at 0.25% of the monthly remuneration for each employee[319]
  - SDL collected are channelled to the Skills Development Fund (SDF) which is used to support workforce upgrading programmes and to provide training grants (up to 80%) to employers when they send their employees to attend training under national Continuing Education and Training system[320]
  - Capability Development Grant (introduced by Enterprise Singapore): One can also choose to adopt standards with the grant. Also, it covers 70% of training and certification cost[321]
- ***Industry Involvement***
  - Key skills, competencies and curriculum are developed collaboratively with the industry[322]
- Singapore launched **National Skills Recognition System** (NSRS) (1999-2004) which ensured that skill standards developed were relevant to the workplace. The system catered for workers to be re-certified when work requirements and performance standards changed. This was replaced by the by the Workforce Skills Qualifications (WSQ)[323].

Inspired by the skills training ecosystem in Singapore many countries such as China, Malaysia, including India have signed an MoU with Singapore to develop and implement skill development programmes across emerging technology areas[324].

[315] https://www.mom.gov.sg/employment-practices/skills-training-and-development/refreshed-cet-masterplan
[316] https://www.mom.gov.sg/employment-practices/skills-training-and-development/refreshed-cet-masterplan
[317] https://www.skillsfuture.gov.sg/
[318] https://www.singaporestandardseshop.sg/Product/SingStd
[319] https://www.shopify.com.sg/blog/skills-development-levy-singapore
[320] https://www.shopify.com.sg/blog/skills-development-levy-singapore
[321] https://cdggrant.com/
[322] https://unevoc.unesco.org/home/Dynamic+TVET+Country+Profiles/country=SGP
[323] Singapore Workforce Development: SABER Multiyear Country Report 2012
[324] Based on newspaper headlines

ITE Singapore (ITES) is a renowned TVET institute across the globe having MoUs with several countries in Asia for reform and modernization of their VET landscape. ITE was established in April 1992 as a post-secondary institute by the country's Ministry of Education. Currently, ITE is a public vocational education institution providing pre-employment training to secondary school graduates and continuing education and training to working adults across its three colleges-central, east and west. It offers degree and certificate courses in the field of Applied & health sciences, Electronics & Info-comm Technology, Business & Services, Engineering, Design & Media and hospitality[325]. Some of the best practices of ITES in terms of training delivery are:

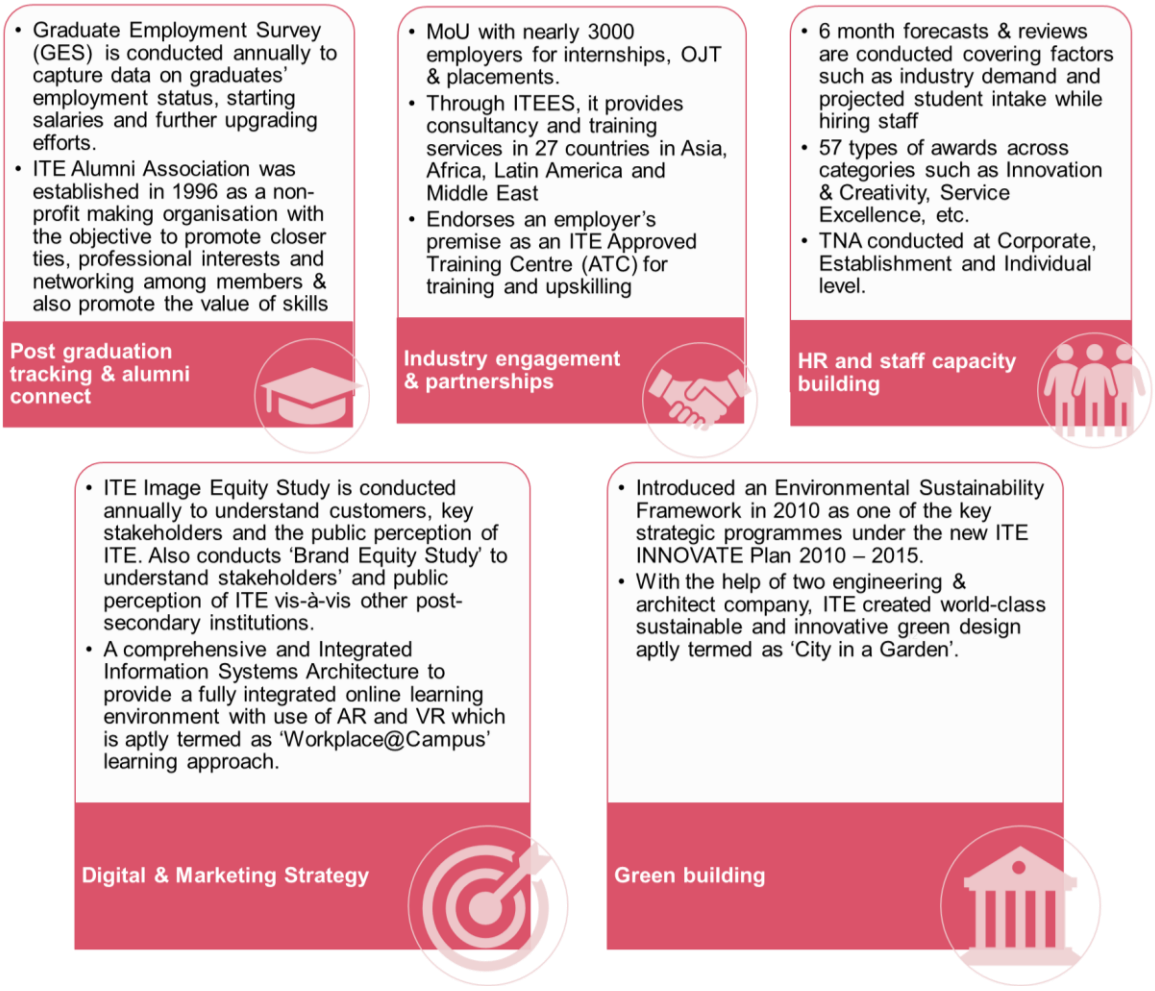
- **Mobilization & Outreach**: Website and social media with support from industry. Life@ITE highlights learners experience and USP of the institute.
- **Counselling & Other Services**: Education and Career Guidance Cell that has a Career Services Centre, Job Portal & Career related resources.
- **Selection & admission**: An aptitude-based admissions exercise followed by an interview.
- **Course and Curriculum**: Designed in close consultation with industry (international business and technology industry partners)
- **Training Delivery**: The training year in ITE is made up of two terms, commencing January and April respectively with training and examination schedule course wise clearly specified.
- **Learning Aids and tools**: Students have access to touch-screen devices, as well as to cloud-based software and digital educational resources. All training facilities/workshops are well equipped with latest technologies such as 3D Applied Technologies, Smart Living Solutions Lab, etc.

Source: ITES Website (https://www.ite.edu.sg/)

The other best practices of ITES across other operational and administrative aspects are charted out in the exhibit below:

[325] https://www.ite.edu.sg/

Figure 46: ITE Singapore best practices



Source: https://www.ite.edu.sg/

7.3.2. Israel: Startup capital of the world

Foundation of technological innovation had its origin with the advent of the country's information and communication technology (ICT) sector in the early 1970s focused on information technology and enterprise software, communications and the internet. The government laid the foundations for private industry to support innovation and made heavy investments in building much-needed human capital. The Israeli education system, supported by the government, contributed greatly to the success of Israel in the high-tech Innovation and Startup arena[326].

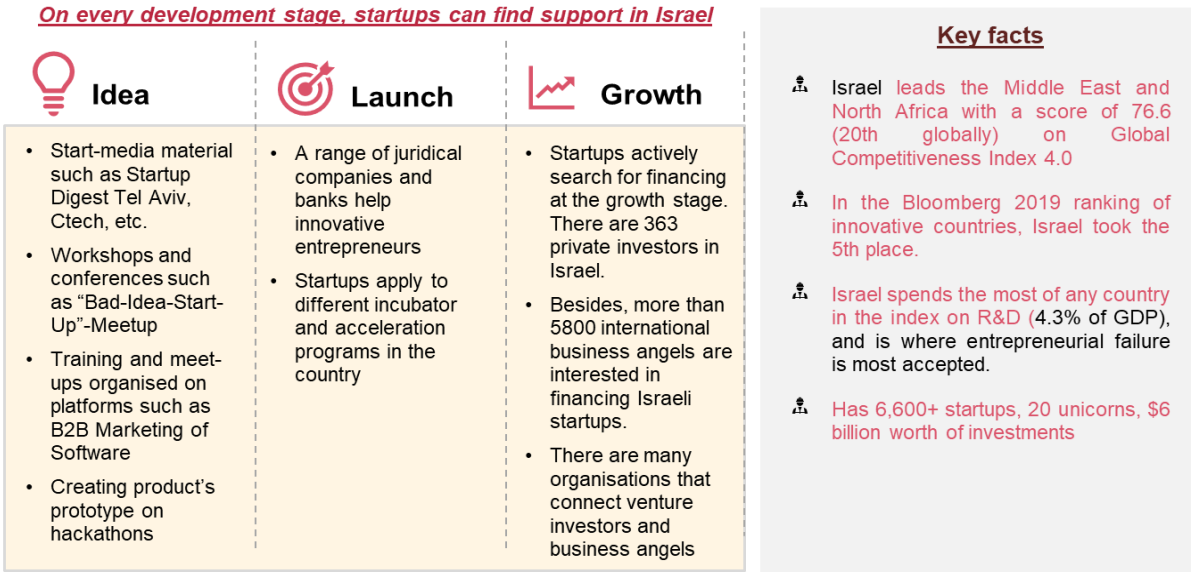
Israel, a small country with a population of around 8.5 million, has earned the title of "Startup and Innovation Nation"[327] mostly because of its unparalleled technological ecosystem. According to start-ups per capita in the world, there is around 1 Startup for every 1,400 people in Israel[328].

Startup ecosystem

[326] Best Practices and Lessons Learned in ICT Sector Innovation: A Case Study of Israel, WDR 2016
[327] https://itrade.gov.il/spain/israeli-companies-on-the-nasdaq/
[328] https://www.forbes.com/sites/startupnationcentral/2018/05/14/israeli-techs-identity-crisis-startup-nation-or-scale-up-nation/?sh=7811a56eef48

Israel's unique society and culture, strong economy and government support are just a few of the factors that make Israel's innovation ecosystem one of the most successful in the world. The Startup ecosystem of Israel is a result of a collaboration between the state (Israel Innovation Authority), military services, venture capital firms, successful entrepreneurs, educational system, business system, incubators and accelerators[329].

Figure 47: Key features of Israel's startup and R&D ecosystem



Source: The Startup ecosystem of Israel- Rocket Dao, Feb 2020

The Israeli government founded the Technology Incubator program in the early 1990s. Today there are over 25 incubators across the country, all of which have been privatized. Moreover, Israeli government approved additional budget of 390 million NIS for Israel Innovation Authority to increase government investment in small to medium high-tech companies[330]. The country's thriving start-up industry is complimented by a flourishing venture capital market. Israel's venture capital industry has approximately 205 Israeli VC firms, about 70 foreign firms and about 60 corporate VCs[331].

TVET ecosystem

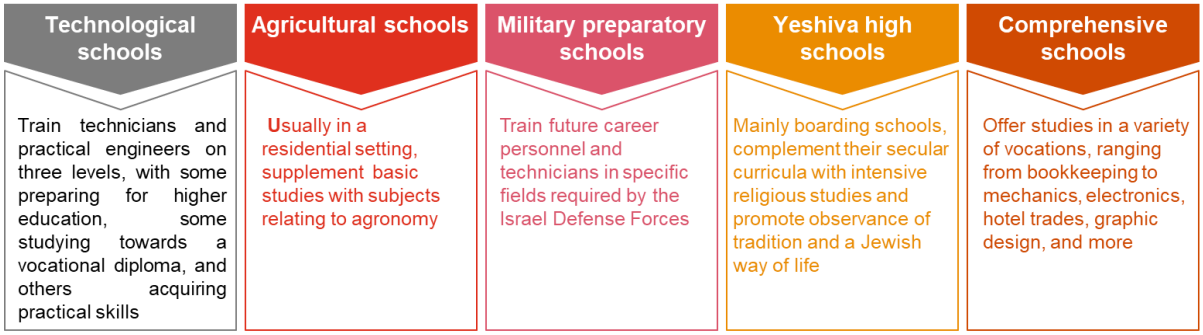
At the national level, the two ministries (Ministry of Education and Ministry of Economy) develop, maintain and finance the distinctive systems of vocational that are established in the public sector by government. **The Ministry of Education and Ministry of Economy** has the responsibility for overall planning, management and ensure successful implementation of different technical and vocational strands of TVET[332]. There are both government-sponsored bodies and private institutions that offer retraining courses subsidized by the government.

Most Israeli students are over age 21 when they begin their studies, after three years' compulsory military service for men and two years for women. Until the early 1960s, students pursued higher education mainly to acquire knowledge, while in recent years they have been more career-oriented, with larger numbers enrolled in the wide range of professional studies now offered. At present, well over

[329] https://startupjedi.vc/content/startup-ecosystem-israel
[330] https://mfa.gov.il/MFA/InnovativeIsrael/Economy/Pages/Government-approves-additional-government-investment-in-small-to-medium-high-tech-companies-19-August-2020.aspx
[331] https://www.ginsum.eu/overview-of-israels-venture-capital-landscape/
[332] https://mk0brookdalejdc1oyrp.kinstacdn.com

half of Israelis in the 20-24 age group are enrolled in one of the country's institutions of postsecondary or higher education.[333]

Figure 48: Types of schools in Israel



Source: Apprenticeship and vocational education and training (VET) in Israeli- OECD Chapter 1

Universities and Regional colleges offer academic courses whereas some, additional tracks are available, leading to certificates or vocational diplomas in a variety of subjects ranging from technology and agriculture to marketing and hotel trades. Post-secondary system is diverse, including professional certifications, private courses, and targeted programmes directed at disadvantaged groups. In addition, there is an active framework of government-led reform. The social partners – both employers and unions – are well organised and are keen to engage.

Israel enjoys the highest percentage of engineers and scientists per capita in the world, and one of the highest ratios of university degrees and academic publications per capita[334]. Israel has a high quality educational system and is among the most educated societies in the world. 49% of population aged 25-64 have tertiary qualifications, well above the OECD average of 35%. Interestingly, among those aged 31-34 proportion of first and higher degree holders has almost doubled, going from 22% to 40% between 1995 and 2011. Owing to its quality of TVET, the country boast of an average of 13 years of schooling (8th globally) and where people acquire the appropriate skills that employers are looking for (2nd globally)[335].

MASHAV: for international collaboration[336]

MASHAV – Israel's Agency for International Development Cooperation is dedicated to providing developing countries with the best of Israel's experience in development and planning. MASHAV, established in 1958 and representing Israel and its people, focuses its efforts on capacity building, sharing relevant expertise accumulated during Israel's own development experience to empower governments, communities and individuals to improve their own lives.

MASHAV's activities focus primarily on areas in which Israel has a competitive advantage, including agriculture and rural development; water resources management; entrepreneurship and innovation; community development; medicine and public health, empowerment of women and education. Professional programs are based on a "train the trainers" approach to institutional and human capacity building and are conducted both in Israel and abroad. Project development is supported by the seconding of short and long-term experts, as well as on-site interventions.

[333] https://mfa.gov.il/MFA/AboutIsrael/Education/Pages/EDUCATION-%20Higher%20Education.aspx
[334] https://www.oecd.org/israel/41559762.pdf
[335] https://www.oecd-ilibrary.org/sites/9789264302051-3-en/index.html?itemId=/content/component/9789264302051-3-en
[336] http://www.fao.org/south-south-gateway/database/detail/en/c/429111/#:~:text=Mandate%3A%20MASHAV%2C%20Israel's%20Agency%20for,tools%20and%20skills%20to%20overcome

7.3.3. Best Practices in case of other international skilling institutes

In addition, numerous other institutes of international repute were studied to holistically understand their best practices throughout the training lifecycle which are delved briefly below:

- **Student mobilization and counselling**: While institutes such as National Technical Training Institute (NTTI) Cambodia[337], ITI Malaysia[338], Technical University of Berlin (TUB) Germany[339] and Australian Institute of Vocational Training and Education (AIVTE) Australia[340] use their website (through news, media and events page) and social media platforms such as Facebook to reach out to prospective candidates, **TAFE institutions[341] in Australia** have developed videos of the campus on their website and reach out to students showing interest through the support of outreach coordinators, marketing cell and media centre. Similarly, Cambridge Regional College (**CRC), UK** in addition to their digital outreach also organise campus tours, annual Counsellor's Seminar and partner with external relations to coordinate open houses. Further, they have developed a student testimonial campaign which broadcasts stories through web and social media[342].
- **Course, curriculum and pedagogy**: Employers /industries /industry bodies are the focal point while designing the curriculum across all studied institutes to ensure that students are equipped with market relevant skills. While project-based teaching and learning formats are implemented within degree programs of Technical University of Berlin (TUB) Germany[343], generic skills and competencies, work skills and digital skills have been infused into the curriculum of Manitoba Institute of Trades and Technology (MITT) Canada[344] and CRC UK[345]. Further, ITI Malaysia's curriculum is 30 - 40% of theory and 60 - 70% of practical. Interestingly, TAFE Institutions are known for their student centric- pedagogical model and offer flexible learning modules (integrating online & on campus learning) via use of software platforms such as WebCT, Blackboard and Top Class[346].
- **Trainers**: Internationally, to address the technical teacher needs of the training centres throughout Cambodia, NTTI organises 'Vocational Technical Teacher Training Program[347].
- **Post-graduation tracking**: National Centre for Vocational Education Research (NCVER) in Australia conducts 'National Student Outcomes Survey' on an annual basis of students who completed their VET during the previous calendar year. The survey collects information across parameters such as their reasons for training, employment outcomes, satisfaction with training, and further study outcomes. The survey results are presented for each TAFE Institution which is published by these Institutes in their annual reports[348].
- **Internship/Exposure visits**: MITT Canada[349] and TUB Germany[350] has strong ties with companies to provide internship opportunities to their students. Interestingly, academics department at AIVTE organise industry exposure visits for students to guide them towards their career paths and assist them in building employer networks for future job opportunities[351].
- **Research and Consultancy services**: TAFE & ITE students conduct applied research projects in partnership with industry to complement formal studies[352].

[337] https://www.ntti.edu.kh/
[338] http://www.ilpkl.gov.my/2015/
[339] https://www.tu.berlin/en/
[340] https://training.gov.au/Organisation/Details/22304
[341] www.tafeinternational.wa.edu.au
[342] MITT Annual Report 2018-19
[343] https://www.tu-berlin.de/?id=218889
[344] https://mitt.ca/
[345] https://www.camre.ac.uk/
[346] https://www.tafensw.edu.au/
[347] https://www.ntti.edu.kh/tvet_training_program.php
[348] https://www.ncver.edu.au/
[349] https://mitt.ca/
[350] https://www.tu.berlin/en/
[351] https://training.gov.au/Organisation/Details/22304
[352] https://www.ite.edu.sg/

- **Customized training modules for employers**: TAFE[353], MITT[354], CRC[355] undertake training need analysis, thereby developing workforce development plan and deliver customized training solutions for employers.
- **Institutional partnerships**: NTTI cooperates with many universities to attend the training program sponsored by AOTS and the California State University[356]. At CRC, students and educators from various countries visit the college for a range of activities, discussions and work placements[357].
- **Branding and communication:** Metric Marketing, MITT's creative partner by building general awareness about MITT and surveying internal and external stakeholders towards redevelopment of MITT's brand platform has successfully increased the institute's presence on both traditional and digital media channels. It is using Google Analytics framework to guide advertising and marketing decisions[358].

[353] https://tafeqld.edu.au/information-for/big-business-solutions/training-needs-analysis.html
[354] https://mitt.ca/employers/create-customized-training
[355] https://www.camre.ac.uk/employers/
[356] https://www.ntti.edu.kh/international_linkages.php
[357] https://www.camre.ac.uk/
[358] MITT Annual Report 2018-19

8. Financial Model

This chapter presents the financial projections for establishing the proposed Assam Skill University. A time frame of 10 years has been considered for estimating the financial feasibility of setting up the envisioned university.

8.1. Overall Cost of Project & Means of Finance

8.1.1. Cost of Project

Assam Skill University would be developed with state-of-the-art infrastructure and facilities with a goal to accommodate 10,000 students at steady state. The campus of ASU would be developed to make it a self-sustaining ecosystem which boasts of state of art academic, administrative and residential facilities in addition to opportunities to purse co-curricular and recreational activities. The overall Cost of the Project is envisaged to be INR 9300 million. The breakup of the Overall Cost of the Project and Means of Finance is as follows:

Table 23: Cost of Project

COST OF PROJECT	in INR million
Land	90
Building	3700
Office Equipment	250
Equipment (incl. lab equipment)	1250
Computer and IT	625
Furniture and Fixtures	250
Electrical equipment	125
Total capex	**6290**
Other Pre-Operative Expenditure	1160
Corpus Fund	450
Other Fund (Scholarship, Infra Dev Endowment etc)	800
Viability Gap Funding	600
Total Cost of Project	**9300**

8.1.2. Means of Finance

The overall cost of the project of INR 9300 million would be funded through a mix of long-term financing from Asian Development Bank and Equity contribution in the ratio of 80:20 respectively. Social infrastructure projects including education and vocational education projects require patient capital. While the project presents a path to self-sustainability and its commitment to self – reliance, it may not be able to achieve this in the initial years. The loan thus structured is in a manner that the funding would be a grant for ASU while the state government would bear the interest coverage cost for the project.

Table 24: Means of Finance

MEANS OF FINANCE	In INR Million
ADB Term Loan	7450
Govt Grants	1850
Total Means of Finance	**9300**

8.2. Projected course-wise Student Ramp-Up

Assam Skill University will have a total of 9 schools and 4 centres which shall offer certification, under-graduate, and post graduate programs including but not limited to three-year D.Voc., one-year diploma, post graduate diploma, B.Voc., M.Voc. amongst others. The projected student ramp up over the 10-year period is as follows:

Table 25: Course-wise Student Ramp-Up (tentative)

Student Ramp up – Overall (By Program)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Certification	840	840	840	2,520	2,520	2,520	3,000	3,240	3,240	3,240
Diploma (Standalone)	240	240	240	1,020	1,020	1,200	1,200	1,500	1,500	1,500
D.Voc.	240	480	720	840	960	1,080	1,080	1,080	1,080	1,080
Bachelor's Degree (B.Voc. etc.)	240	480	720	1,680	2,400	3,120	3,840	3,840	3,840	3,840
PG Diploma/ B.Voc Honors	-	-	-	120	120	120	120	240	240	240
Master’s Degree (M.Voc. etc.)	-	-	-	430	430	430	430	430	430	430
Doctoral (PhD etc.)	-	-	-	30	60	90	120	150	150	150
Gross Enrolment – Full time program + Certification	1,560	2,040	2,520	6,640	7,510	8,560	9,790	10,480	10,480	10,480

Student Ramp up – Overall (By Program)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Less: Dropouts	36	60	84	210	255	309	348	370	370	370
Net Enrolment – Full time program + Certification	1,524	1,980	2,436	6,430	7,255	8,251	9,442	10,110	10,110	10,110
Net Enrollments - MDP/FDP	0	0	0	100	100	200	200	300	400	400
Total Students	**1,524**	**1,980**	**2,436**	**6,530**	**7,355**	**8,451**	**9,642**	**10,410**	**10,510**	**10,510**

Note: The above numbers depicted are a total number of students and not student enrolments.

8.3. Revenue

The university would have a well-diversified revenue generation strategy. These include Tuition Fees, Hostel and Mess Charges, Interest Income, Endowments, Research and Consultancy Income, Assessment, Certification, Affiliation and Accreditation Fees and income from allowable sub - letting of infrastructure and spaces made available on the campus.

The contributors to the internal revenue generation for the university would be the Tuition Fees, Hostel and Mess Charges earned from students. Other revenue streams such as Research and Consultancy could potentially be a significant contributor in the future. However, for the purpose of model, these have been currently estimated using modest assumptions in order to be conservative. Over time other alternate revenue streams merchandise, advertisements and sponsorships, could also be explored and monetised.

8.3.1. Tuition Fees, Hostel Fees & Mess Charges

A cost-based approach complemented with secondary analysis of close to 50 institutions, both public and private in Assam, North east and the rest of India was done to derive the recommended fees. Special emphasis was given to technical institutions and other skill universities while forming and recommending the fees for ASU. The fee structure proposed is as follows:

Table 26:Tuition Fees, Hostel Fees & Mess Charges (tentative)

Type of program	Annual Tuition Fees	Hostel Fees	Mess Charges
Diploma (Standalone)	INR 20,000	INR 24,000 (INR 2,000 per month) Hostel would be optional facility	INR18,000 (INR 1,500 per month) Mess Facilities will also be optional and can be used on pay for use model
D.Voc.	INR 20,000		
Advance Diploma	INR 60,000		
Bachelor's Degree (B.Voc. etc)	INR 65,000		
PG Diploma	INR 70,000		
Master's Degree (M.Voc.)	INR 75,000		
PhD	INR 30,000		

The fees depicted above is for general category of students without factoring in the waivers either on account of reservation policies or scholarships. A significant number of students would either fall under various reservation policies of the state or would be offered a merit cum means scholarship. This has been factored separately in the model. The quantum of these scholarship could range between 25% scholarship to full tuition fees waiver basis the scholastic achievement of the student. During year one it is estimated 70-80% of the gross fee realisations would be offered as scholarships and over time this shall reduce to 45% (thus also factoring in the reservation policies) by the seventh year. It may also be noted that waiver in the form of freeships or scholarships shall only apply to Tuition Fees and not the Hostel and Mess Charges.

8.3.2. Other Income

The contribution of other income ranges from 6 - 10% during inception years of university. The other income streams include revenue from infrastructure (guest house, auditorium, classrooms etc), interest income, income from research and consultancy, income from assessment, affiliation and certification, income from conducting short term training programs including but not limited to Management Development Programme (MDP), Faculty Development Program (FDP), Training of Trainer (ToT) Programmes. The following are the basis for key assumptions around the other income:

Table 27: Income from other potential revenue streams

Potential revenue stream	Description
Certification programs	Students enrolled in certification programs shall be charged an average fee of INR 30,000 per programme. It may be noted that this is the average fee and depending on the duration and level of the programs, the fee may be varied keeping in mind the cost of delivery.
Guest house facility	The rent of the rooms in guest house is assumed at INR 1,000 per day for the base year and this would be adjusted for the inflation on a year on year basis.

Potential revenue stream	Description
Affiliation, Assessment and/or Certification Fees	The university may also run certification programs which could be either NSQF aligned or other programs designed by its academic team and/or programs designed in consultation with the industry. The students enrolled in such programs shall be charged INR 1,000 for assessment and certification. In addition to assessment and certification, the University shall enrol and affiliate colleges who wish to run programs B.Voc., diploma or any other technical and vocational programs within the territorial jurisdiction of Assam. The revenue realization from affiliating and re-affiliating each institution is assumed to be INR 2,00,000.
Training and development	The university would run faculty and trainer development programs with the goal of developing the overall TVET ecosystem of the state including Polytechnics, ITIs, training partners. The fee for a 5-day program is assumed to be INR 10,000. The fees proposed may be taken indicative and for the purpose of developing the model and here too the actual fees may vary basis the duration and the program coverage. The fee may be aligned basis the actual delivery costs envisaged at the time of conceptualising such programs. Incentive structures may also be considered to encourage faculty to design and deliver programs under the aegis of ASU and its partner ecosystem.
Sweating of University Infrastructure	The infrastructure once developed would be thrown open to multiple avenues to optimise internal revenue generation. These may include sub-letting of playground, auditoriums, classrooms, examination halls and many others.
Research and consultancy	The annual consultancy income per faculty is assumed to be INR 1,20,000 out of which 20% is assumed to be the share of the university. In the future given that ASU has close to 83 acres at its disposal, a number of other possibilities may open up like income streams from PPP of a K-12 school on the campus, COEs development on BOOT model which aim at fee based self-financed programs and target skilling/upskilling and re-skilling programs.
Financial contributions / Endowments	Endowments either through CSR contributions from industries and / or philanthropic organisations and other HNIs can also be a focus area for the university. However, for the purpose of modelling this stream is kept NIL in order to be conservative.
Interest Income on Corpus Fund	Interest income will be realised on the corpus / endowment fund which will help absorb increase in operating costs, also reducing dependency on fee hikes. The interest income earned can be utilised towards capital expenditure, estate upkeep and maintenance, scholarship and student welfare, employee welfare and contingency expenses. The corpus fund of the university is estimated to earn 6% interest annually in year 1 which will gradually reduce to 5% in year 10 thereby factoring the actual trend of a falling interest rate regime.

8.4. Expenses

The key line items that comprise the expenses for a University are manpower (including teaching, non-teaching and other support staff), expenses towards academic delivery such teaching learning aids, content development cost, lab consumables, other operating expenditures towards day to day campus upkeep such as electricity, water consumption, hostel and mess related expenses, travel and conveyance, repairs and maintenance, student outreach expenses and other miscellaneous and contingent expenses. Drawing our experience from observing other universities, the manpower expenses are the most significant line item and amongst them the teaching staff costs are typically the key contributors. The Assam Skill University also follows a similar pattern. The following are key assumptions taken for the purpose of modelling:

8.4.1. Teaching Staff Expenses

The human resource related costs would primarily be towards the salary expenses paid to the teaching and non-teaching staffs of the university. There will also be an incurred cost towards the visiting faculty of the university. Following are the key assumptions made while estimating the overall HR costs:

- The teaching staffs at the institute would be a mix of full time regular / non-tenured faculty and tenured faculty comprising of visiting / adjunct / professionals from industry.

- Given that the University has been established though a state act and would be a publicly funded university, the salary levels for regular staff would follow the pay commission recommendations from time to time. Currently, the seventh pay commission is in force and the same pay scales have been used for estimating the costs. The following is the average compensation levels estimated for the regular staff:

Table 28: Teaching Staff Compensation (tentative)

Designation	Compensation Band	Average Compensation for the model
Professor	INR 21,00,000 – 24,00,000 per annum	INR 21,60,000 per annum
Associate Professor	INR 15,00,000 – 18,00,000 per annum	INR 18,00,000 per annum
Assistant Professor	INR 10,00,000 – INR 12,00,000 per annum	INR 10,20,000 per annum

The above compensation is only for the base year, i.e. the starting year of the University and is compounded by 5% on a year on year basis in the financial model to factor in the inflation and subsequent pay revisions as and when they come into force. It may be noted that the actual compensation offered will be fitted as per the grade, bands as defined by the compensation structure which shall be developed close to the actual start of operations of the university and then would be aligned to the experience and qualification of the teaching staff.

- The total number of faculty members at the university has been estimated based on the annual installed training hours (classroom and lab) for all the batches at the university and the total contact hours of 1 faculty per week considering they teach for 20 hours per week for 30 weeks every year. The actual number of faculty required varies basis the student ramp and on the basis of the current assumptions the university would require a total of 217 regular faculties at steady state.

Table 29: Split of regular teaching staff (tentative)

Y-o- Y Split of Regular Staff Required (Nos.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Professor	2	3	4	11	15	19	23	24	24	24
Associate Professor	3	6	9	23	29	38	45	48	48	48
Assistant Professor	9	16	26	68	88	113	136	145	145	145
Total	**14**	**25**	**39**	**102**	**132**	**170**	**204**	**217**	**217**	**217**

- Given that, ASU would have strong interlinkages with the industry and the university will partner with industries to co-create and deliver programs, the university will have a significant portion of academic delivery happening through professionals from the industry and other specialists called upon as visiting and adjunct faculty. Such professionals as proposed would be paid by the hour and the average compensation would be INR 1000 per hour. It is also recommended that in order to optimise such arrangements, the process of academic planning is done closely in consultation with the faculty so that more classes can be delivered on a single day. The ideal recommended teaching commitment is 5 hours per-day and it is recommended that guest scholars and professionals are invited for a week, month or entire semester which also creates a win-win situation for either parties.
- In addition to the above, lab assistants, librarians, research and teaching assistants would also be onboarded and contribute to the academic delivery.
- Overall, during the first three years the University will operate out of a temporary campus. The Faculty: Student Ratio (FSR) is estimated to be in the range of 1:30 – 1:20. Once the full scale campus is launched and the students and courses are ramped up, the Faculty : Student Ratio at steady state will be around 1:25. It is also advised that the management over time takes steps to bring down the FSR to 1 : 20 and below.

8.4.2. Non-Teaching Staff Expenses

The non - teaching staff comprises of management, administration and other support staff. A total of 130 key management and administrative staff including some support staff such as peons, clerks, secretary, data entry operations and other support staff are proposed. The following is the list of the administrative and support function along with the base salaries in Year 1 which is compounded at 5% each year.

Table 30: Non-teaching staff compensation (tentative)

Non-Teaching Staff - Key Officers	Starting Salary (IRN pa)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Vice Chancellor's Office											
Vice Chancellor	3240000	1	1	1	1	1	1	1	1	1	1
OSD to VC	840000	1	1	1	1	1	1	1	1	1	1
PS to VC	600000	1	1	1	1	1	1	1	1	1	1
Steno cum typist	300000	1	1	1	1	1	1	1	1	1	1
Clerk cum Data Entry Operator	300000	1	1	1	1	1	1	1	1	1	1

Non-Teaching Staff - Key Officers	Starting Salary (IRN pa)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Peon	216000	1	1	1	1	1	1	1	1	1	1
Registrar Office											
Registrar	2400000	1	1	1	1	1	1	1	1	1	1
PS to Registrar	600000	1	1	1	1	1	1	1	1	1	1
Clerk cum Data Entry Operator	300000	1	1	1	1	1	1	1	1	1	1
Steno Typist	300000	1	1	1	1	1	1	1	1	1	1
Peon	216000	1	1	1	1	1	1	1	1	1	1
Establishment Office											
Section Head	1500000				1	1	1	1	1	1	1
Superintendent - Construction	1200000				1	1	1	1	1	1	1
Superintendent - IT & Networking	1200000				1	1	1	1	1	1	1
Superintendent - Engineering works	1000000				1	1	1	1	1	1	1
Assistant Engineers	720000				4	4	4	4	4	4	4
Estate Manager	720000				1	1	1	1	1	1	1
Clerk cum Data Entry Operator	300000				1	1	1	1	1	1	1
Peon	216000				1	1	1	1	1	1	1
Academic Office											
Controller of Examinations	2100000	1	1	1	1	1	1	1	1	1	1
Director - Academic Planning	1800000	1	1	1	1	1	1	1	1	1	1
Director - Examination	1800000	1	1	1	1	1	1	1	1	1	1
Academic coordinators	1800000	1	1	1	3	3	3	3	3	3	3
Academic Assistants	960000	2	2	2	4	6	8	10	10	10	10
Clerk cum Data Entry Operator	300000	1	1	1	5	5	5	5	5	5	5
Peon	216000	1	1	1	5	5	5	5	5	5	5
Finance & Accounts											
Controller of Finance cum Head	2100000	1	1	1	1	1	1	1	1	1	1

Non-Teaching Staff - Key Officers	Starting Salary (IRN pa)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Budget Accounts Officer	1800000	1	1	1	1	1	1	1	1	1	1
Stores & Purchase Officer	1200000	1	1	1	1	1	1	1	1	1	1
Procurement Officer	1200000	1	1	1	1	1	1	1	1	1	1
Internal Audit Officer	960000	1	1	1	1	1	1	1	1	1	1
Section Officers - Finance	840000	1	1	1	4	4	4	4	4	4	4
Section Officers - Accounts	840000	1	1	1	4	4	4	4	4	4	4
Human Resource Officer											
Head – HR	1200000	1	1	1	1	1	1	1	1	1	1
Human Resources Officer	800000	1	1	1	1	1	1	1	1	1	1
HR Executives (Hiring, APR, Exit)	480000	1	1	1	4	4	4	4	4	4	4
Legal & Documentation											
Head – Legal	1200000	1	1	1	1	1	1	1	1	1	1
Law Officer	800000	1	1	1	1	1	1	1	1	1	1
Documentation Officers	600000	1	1	1	4	4	4	4	4	4	4
RTI Officer	600000	1	1	1	1	1	1	1	1	1	1
Partnerships and Alliances											
Director	1200000	1	1	1	1	1	1	1	1	1	1
Endowments and Fund-Raising Officer	800000	1	1	1	1	1	1	1	1	1	1
Alumni Affairs Officer	800000	1	1	1	1	1	1	1	1	1	1
Industry Engagement Officer	800000	1	1	1	3	3	3	3	3	3	3
Academia Engagement Officer	800000	1	1	1	2	2	2	2	2	2	2
Student Outreach & Branding											
Director	1200000	1	1	1	1	1	1	1	1	1	1
Deputy Director – Outreach	1000000	1	1	1	1	1	1	1	1	1	1
Deputy Director – Branding	1000000	1	1	1	1	1	1	1	1	1	1
Student Outreach Officers	600000	3	3	3	8	8	8	8	8	8	8

Non-Teaching Staff - Key Officers	Starting Salary (IRN pa)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Content Writer	600000	1	1	1	2	2	2	2	2	2	2
Social & Digital Expert	600000	1	1	1	2	2	2	2	2	2	2
Public Relations Officer	600000	1	1	1	1	1	1	1	1	1	1
Admissions Officer	600000	1	1	1	4	4	4	4	4	4	4
Counselling Officer	600000	1	1	1	2	2	2	2	2	2	2
Tele Calling Executive	360000	1	1	1	3	3	3	3	3	3	3
Career Development Center											
Director	1200000	1	1	1	1	1	1	1	1	1	1
Counselling Officer – Career Guide	720000	2	2	2	2	2	2	2	2	2	2
Placement Executives	720000	2	2	2	10	10	10	10	10	10	10
Student Affairs											
Student Affairs Officer	960000	2	2	2	2	2	2	2	2	2	2
Support Staff	180000	1	1	1	1	1	1	1	1	1	1
Counselling Officer - PC	720000	2	2	2	2	2	2	2	2	2	2
Research & Innovation Cell											
Director	1200000				1	1	1	1	1	1	1
R&I Management Officer	960000				1	1	1	1	1	1	1
Grant Proposal Writer	960000				1	1	1	1	1	1	1
Research Assistant	960000				1	1	1	2	2	2	2
Total		**60**	**60**	**60**	**123**	**125**	**127**	**130**	**130**	**130**	**130**

8.4.3. Other operating costs

The other operating costs would include electricity charges, water cost, mess cost, lab consumables cost, content development cost, expenses towards events and seminars, facility management cost, travel and conveyance etc. The table below provides the detailed list of other operating costs assumed for the university.

Table 31: Other potential Operating Expenses

S.No.	Particulars	Key Assumptions
1.	**Electricity and water cost**	• Electricity: INR 3 per sq. ft. of the built-up area per month • Water: 135 liters of average water consumption per person per day
2.	**Facilities Management**	• This line item would cover Security, Housekeeping & other staff such as gardeners, maintenance staff electricians, plumbers, etc. • The cost assumption is INR 1.5 per sq. ft. of the built-up area per month. • These may be either brought in as in-house staff our may be outsourced to professional agencies or a mix of the same can also be explored.
3.	**Mess cost**	• INR 2,400 per student per month
4.	**Printing and stationery**	• INR 50 per student per month • INR 100 per teaching staff per month • INR 150 per non-teaching staff per month
5.	**Lab consumables**	• INR 500 per student per month
6.	**Travel and conveyance**	• 3 round trips in a year with an average cost of INR 15,000 per roundtrip; 15% faculty incurring this cost

S.No.	Particulars	Key Assumptions
7.	**Other annual operating expenses**	A lumpsum annual cost for the base year towards the following line items costs is factored into the financial model which will grow by 5% each year going forward. • Website Maintenance: INR 1,20,000 • Audit expenses: INR 1,00,000 • Postal charges: INR 50,000 • Legal expenses: INR 1,00,000 • Induction and Graduation expenses: INR 20,00,000 • Marketing expenses: INR 15,00,000 • Other Misc. and Contingent expenses: INR 10,00,000
8.	**Content development cost**	• INR 2,000 per student per year
9.	**Assessment and certification charges**	• INR 800 per student (towards certification programs run by the University)
10.	**Cost of organizing events on campus**	• INR 25,000 per event / seminar

8.5. Overall Financial Projections

8.5.1. Fund Flow Statement

Table 32: Fund Flow Statement (tentative)

Assam Skill University - Fund Flow Statement										in INR million
Details	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Total Revenue										
Realizations from Tuition Fees										
Gross Realizations	25	48	73	218	290	373	456	501	526	553
Less: Leakage due to dropouts	1	1	2	6	7	10	12	13	13	14
Less: Scholarship Disbursed	20	38	51	130	144	168	205	225	237	249
Net Realizations from Tuition Fees	**4**	**8**	**20**	**83**	**138**	**196**	**239**	**263**	**276**	**290**
Other Income										
Short Term Certification Courses	25	26	28	88	92	96	121	137	144	151
Hostel Charges	9	15	22	57	72	92	108	121	127	133
Mess Charges	6	11	17	43	55	69	82	92	96	101
Guest House	0	0	0	2	4	6	8	11	14	17
Income from Research & Consultancy	0	0	0	2	3	4	6	6	4	7
Training and Development (EDP/FDP/MDP)	0	0	0	1	1	2	2	4	5	5
Assessment and Placement Fee	1	1	1	3	3	3	4	5	5	5
Affiliation fees	0	0	0	2	3	4	4	5	5	6
Auditorium Infra	0	0	0	2	2	3	3	3	3	3
Interest on corpus fund	6	6	7	6	7	7	7	7	8	8

Assam Skill University - Fund Flow Statement										in INR million
Details	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
A: Total Revenue	**52**	**68**	**94**	**289**	**381**	**483**	**584**	**653**	**689**	**727**
Operating Expenses										
Salary Cost - Teaching Staff	29	49	74	229	294	377	459	510	535	562
Salary Cost – Non - Teaching Staff	54	57	60	114	122	130	141	148	155	163
Mess cost	5	9	13	34	44	56	66	73	77	81
Lab consumables	7	9	11	30	34	40	46	51	52	53
Content Development Cost	3	4	6	15	18	22	26	29	31	33
Events and Seminars	5	6	6	12	13	13	13	13	14	14
Electricity cost	8	8	8	28	28	29	29	29	29	29
Facility Management Cost	4	4	4	14	14	14	14	14	14	15
Water cost	1	1	1	3	4	5	5	5	6	6
Printing and Stationery	1	1	1	3	4	5	6	7	7	8
Travel and Conveyance	0	0	0	1	1	2	2	2	2	3
Telecommunication (Internet, Telephone)	1	1	1	1	1	2	2	2	2	2
Assessment and Certification Charges	1	1	1	2	2	2	3	3	3	3
Outreach Expenses	5	7	9	15	18	18	22	21	22	23
Other Operating Expenses	5	5	5	6	6	6	7	7	7	8

Assam Skill University - Fund Flow Statement										in INR million
Details	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
B: Total Expenses	**129**	**162**	**201**	**509**	**604**	**720**	**840**	**915**	**957**	**1001**
A-B: Operating Surplus /(Deficit)	**(77)**	**(94)**	**(107)**	**(220)**	**(223)**	**(237)**	**(255)**	**(262)**	**(267)**	**(274)**
Depreciation	1	2	326	386	386	386	386	386	386	386
Net Surplus/(Deficit) - c/f to b/s	**(78)**	**(96)**	**(433)**	**(606)**	**(609)**	**(623)**	**(641)**	**(648)**	**(653)**	**(660)**

8.5.2 Balance Sheet

Table 33: Balance Sheet (tentative)

Assam Skill University - Balance Sheet										in INR million
LIABILITIES	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Source of Funds										
Capital Fund / Sustainability Corpus	77	171	278	498	721	959	1,214	1,476	1,744	2,017
Reserve & Surplus										
Corpus Fund	100	100	100	100	100	100	100	100	100	100
Other Funds /Corpus										
Reserve & Surplus	(78)	(174)	(607)	(1,212)	(1,822)	(2,445)	(3,086)	(3,734)	(4,387)	(5,046)
Loan Funds										
ADB Loan - Infra	1582.5	2890	6290	6290	6290	6290	6290	6290	6290	6290
Other Loan										
Current Liabilities	32	41	50	127	151	180	210	229	239	250
LIABILITIES - TOTAL	**1,714**	**3,028**	**6,111**	**5,803**	**5,441**	**5,084**	**4,728**	**4,361**	**3,986**	**3,611**
ASSETS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Fixed Assets										
Gross Fixed Assets	1,583	2,890	6,290	6,290	6,290	6,290	6,290	6,290	6,290	6,290
less: Depreciation	1	3	329	715	1,100	1,486	1,872	2,257	2,643	3,029
Net Fixed Assets	1,582	2,887	5,961	5,575	5,190	4,804	4,418	4,033	3,647	3,261
Current Assets	13	17	24	72	95	121	146	163	172	182
Investments	100	100	100	100	100	100	100	100	100	100
Cash	19	23	27	55	56	59	64	66	67	68
ASSETS - TOTAL	**1,714**	**3,028**	**6,111**	**5,803**	**5,441**	**5,084**	**4,728**	**4,361**	**3,986**	**3,611**

8.5.3 Cash Flow Statement

Table 34: Cash Flow Statement (tentative)

Assam Skill University - Cash Flow Statement										in INR million
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Net Fund Flow - Surplus /(Deficit)	(74)	(96)	(433)	(606)	(609)	(623)	(641)	(648)	(653)	(660)
Add: Depreciation	1	2	326	386	386	386	386	386	386	386
	(77)	(94)	(107)	(220)	(223)	(237)	(255)	(262)	(267)	(274)
Financing Activities										
ADB - Term Loan	1,583	1,308	3,400	-	-	-	-	-	-	-
Corpus Fund	100	-	-	-	-	-	-	-	-	-
Capital Fund	77	94	107	220	223	237	255	262	267	274
Investing Activities										
Fixed Assets	1,583	1,308	3,400	-	-	-	-	-	-	-
Investments	100	-	-	-	-	-	-	-	-	-
Operating Activities										
Changes in working Capital	(19)	(4)	(3)	(28)	(1)	(3)	(5)	(2)	(1)	(2)
Net Cash Flow	**19**	**4**	**3**	**28**	**1**	**3**	**5**	**2**	**1**	**2**
Cash/Bank - Opening Balance	-	19	23	27	55	56	59	64	66	67
Cash/Bank - Closing Balance	19	23	27	55	56	59	64	66	67	68

8.6. Concluding Remarks

One of the key goals of Assam Skill University shall be to further the state's effort towards inclusion, a key pillar that relies on equipping the marginalised sections and bringing them into the fold of mainstream higher education. This shall help in contributing to the ongoing efforts towards formalisation of vocational education with that of the higher education. Commenting only on the overall financial sustainability while being mindful of these objectives would perhaps not do adequate justice to this strategically vital project. It will not only allow Assam to emerge as a key economic force but also enhance the socio-economic and environmental sustainability of the state and the entire north eastern region. The University may not be able to achieve operational break even in the first 10 years of its existence but adequately demonstrates that the university is suggested to be committed to its goal of financial self - sustainability and would achieve the same between the 12th and 15th year of its operations. Above all, the University would impact overall 1,00,000 beneficiaries (70,000 and 30000 directly and indirectly) in the first 10 years of its exitance and this would only grow due to the multiplier effect on the state pegging the Social IRR of the Project.

9. Recommended Roll-out Plan

The roll-out plan shown in the table below for the Assam Skill University is recommendary in nature and the timelines of the below mentioned activities may be impacted due to the ongoing COVID-19 pandemic and other situational factors.

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
1	**ASU Campus Infrastructure**																
1.1	Identification and approval for renting the temporary campus	One-time activity															
1.2	Procurement of relevant furniture, equipment (As per School requirements). at the temporary campus	One-time activity															
1.3	Completion of Campus construction in Mangaldoi	Ongoing until year 4															
1.4	Procurement of relevant furniture, equipment (As per School requirements). at the main campus	Ongoing until year 5															
2	**Human Resource Management and Governance**																
2.1	Finalize the governance structure	One-time activity															
2.2	Prepare ASU's operational, human resources, and financial plans and policies	One-time activity															
2.3	Prepare ASU's administrative and quality assurance manuals	One-time activity															
2.4	Prepare students' handbook, campus policies, administrative procedures, and operating manuals	One-time activity															
2.5	Selection and recruitment of key appointment holders such as VC and non-academic positions for the temporary campus	One-time activity															

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
2.6	Recruitment of faculty for the 4 schools to be operationalized in the temporary campus	One-time activity															
2.7	Selection and recruitment of key appointment holders for all academic and non-academic positions for the main campus	One-time activity															
2.8	Filling of any empty positions and recruitment for additional positions																
2.9	Professional and leadership development for staff members	Ongoing															
3	**Courses, curriculum, credit and assessment frameworks**																
3.1	Onboarding of the Market Research Agency	One-time activity															
3.2	Finalization of occupations and courses	The first 4 Schools should be prioritized, and the rest may happen over the course of the next 2 years															
3.3	Onboard sectoral SMEs, Academic experts, curriculum development experts for curriculum design																
3.4	Finalize courses, the aligned credit framework, assessment framework for the courses																
3.5	Map equipment requirement for each School and Center																
3.6	Facilitate procurement of the equipment as required																
3.7	Review course content in collaboration with SSC, industry, academic experts, etc.	Once in two years															
4	**Faculty and staff development**																
4.1	Finalize methodology and workplan for training needs assessment of trainers, instructors, assessors, and faculty of ITIs, polytechnics, and engineering colleges	One-time activity															

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
4.2	Undertake Training Need Analysis (TNA) of faculty and staff to understand the perceived training needs (technical and behavioral)	At beginning of the academic year, every year															
4.3	Prepare Training Needs Matrix highlighting the immediate and long term (technical and behavioral) training requirements	At beginning of the academic year, every year															
4.4	Develop Training Calendar identifying training topics and offering options	At beginning of the academic year, every year															
4.5	Develop formats for monitoring effectiveness of trainings including trainer feedback forms	One-time activity															
4.6	Undertake regular monitoring of the training programs	Twice a year															
5	**R&D and innovation**																
5.1	Identification of perquisites for operationalizing Center for Entrepreneurship and Innovation	One-time activity															
5.2	Identification of perquisites for operationalizing Center for Skills Research and Development	One-time activity															
5.3	Design and run competitions to identify potential entrepreneurship and incubation ideas	On a regular basis (this will depend on the types of competitions organized)															
5.4	Alignment and taking benefit of govt. schemes as required	Ongoing															

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
5.5	Identify training modules/courses/programs to be offered	This will be done on a regular basis since entrepreneurship will be sector agnostic and hence the training modules will vary depending upon the interest area of the potential entrepreneur.			■	■	■	■	■	■	■	■	■	■	■	■	■
5.6	Expansion of Center for Entrepreneurship and Innovation targeting micro and small enterprises in Assam and North East region	One-time activity											■	■	■	■	■
6	**Student Mobilization and Admissions**																
6.1	Develop and finalize the mobilization, IEC and selection strategy for each target segment	One-time activity	■														
6.2	Finalization of Mobilization and IEC guidelines and roles and responsibilities of different stakeholders viz. ASU, branding and communication firm, training implementation partners, industry	One-time activity	■														
6.3	Development of IEC material – program specific and channel specific	One-time activity	■														
6.4	Revisit and mobilization strategy and update as required	Once in two years	■				■				■			■		■	
6.5	Finalize admission plan for each program	One-time activity	■								■						
6.6	Develop test material bank for entrance tests	On a regular basis	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6.7	Undertake regular admissions (through entrance tests)	July to August of each year		■		■		■		■		■	■	■	■	■	■
6.8	Identifying and partnering with potential testing centers in Assam and other states	One-time activity	■														
6.10	Developing and finalize counselling SOP	One-time activity	■														
6.11	Hire counsellors	On a regular basis	■	■													

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
6.12	Revisit the admission and counselling process and initiate changes as required	Once in five years															
7	**Branding & Communication Strategy**																
7.1	Finalizing ToR for hiring branding, marketing and communication agency	One-time activity															
7.2	RFP process for hiring of an agency	One-time activity															
7.3	Finalizing branding assets and guidelines – Formalizing the brand	One-time activity															
7.4	Finalizing communication strategy, tools and marketing plan	One-time activity															
7.5	Implementation of branding assets and marketing plan	Annually															
8	**Industry Engagement**																
8.1	Develop an industry engagement strategy, identify potential Industry Partners for each Program	Prioritize identification in the Year 1 for the first 4 school programs; Need based activity and ongoing as an when required															
8.2	Identify industry partners for apprenticeship, OJT, Placements	At the beginning of each year and as and when required															
8.3	Develop assets (PPTs, brochures, etc.) for outreach	One- time activity, the collaterals can be updated on a regular basis															
8.4	Outreach to each identified industry partners and onboarding	Quarterly or depending on when new programs are introduced															
8.5	Establish and update database of potential industry and strategic (non-industry) partners	Regular basis															
9	**Strategic Partnerships**																

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
9.1	Develop strategic partnership strategy, identify potential partners at an institutional level (such as academic institutions, SSCs, etc.)	Prioritize identification in the Year 1 for the first 4 school programs; Need based activity and ongoing as an when required															
9.2	Forge partnerships	Regular basis															
9.3	Shortlist trades among 56 WorldSkills trades and align relevant curriculum	Once a year															
9.4	Conduct internal competitions to shortlist students	Quarterly															
9.5	Organize extra coaching sessions for shortlisted students, counselling, and assessments	Monthly (depending on the trade requirement)															
9.6	Enable students to participate in national level skills competitions	Annually															
9.7	Enable students to participate in the international World Skills	Once in two years															
9.8	Apply for becoming an accredited NIOS center	One-time activity															
9.9	Apply for becoming a Basic Training Provider for NAPs	One-time activity															
9.10	Apply for accreditation with NAAC	One-time activity															
9.11	Apply for reassessment of NAAC (min. of 1 year and before 3 years)	Once in two years															
9.12	Apply for NIRF ranking	Annually															
10	**Remote learning and digital content development**																
10.1	Procure an agency to develop an LMS platform	One-time activity															
10.2	Development of ERP, IT enabled solutions and other platforms specifications and allied documents for ASU's digital campus	One-time activity															

S.No	Proposed Activities	Frequency	Year														
			1		2		3		4		5		6	7	8	9	10
			HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2	HY1	HY2					
10.3	Procure and agency(ies) to develop an ERP, IT enabled solutions and other platforms	One-time activity															
10.4	Development of ERP, IT enabled solutions and other platforms	One-time activity															
10.5	Regular monitoring of the hired vendor(s)	Monthly basis															
10.6	Offering online programs (in alignment with UGC and NAAC guidelines)	On a regular basis (the duration for each online program may vary)															

***

Annexure

Annexure I: Training Trainer programs across India

S.No.	Institution Name	Govt/Private (Year of Establishment)	Number & Type of Trainings	Certification	Course Duration	Course Fees	Contact Details	Source
1	NITTR	Govt (1964)	10 Academic and 10 Overseas certification courses, PG Programs, Research Programs	Certificate Course on Total Solution for Integrated Library System & Institutional Repository	2 Weeks	INR4000/week	Job Title: The Director Director: (+91-44) 2254 1982 Phone:(+91-44) 2254 5401 / 2254 5406 / 2254 5442 Fax: (+91-44) 2254 1126 Email Id: dir@nitttrc.ac.in Website: www.nitttrc.ac.in	https://www.nittrc.ac.in/overseas.php
				Certificate Course on Green Skills in Academic Institution to Achieve Sustainable Development	2 Weeks			
				Certificate Course on Skill Development for Tvet Trainers and Planners	2 Weeks			
				Certificate Course on Transforming Educational Ecosystem through Blended Approach	2 Weeks			
				Certificate Course on Curriculum Design and Instructional Materials Development	2 Weeks			
				Certificate Course on Quality Assurance & Accreditation in Technical & Higher Education	2 Weeks			
				Certificate Course on Women Leadership Development in Tvet	2 Weeks			
				Certificate Course on Curriculum Evaluation for Administrators and Planners	2 Weeks			
				Advanced Certificate Course on Design of Educational Applications using Web Technologies	4 weeks			
				Certificate Course on Strengthening Technical and Vocational Education & Training (TVET) Systems to Meet the Sustainable Development Goals(SDG) of United Nations	2 Weeks			
2	National Power Training Institute	Govt (1993)	1	Short Term Courses - Trainers in Power Sector to increase their knowledge and skill to impart training in operation and maintenance of power station.	1 Week	-	BTPS Compound, Mathura Road, New Delhi - 110044 Phone: 011-26940722, 26947043, Fax: 011-26940722	https://npti.gov.in/training-trainers-0 https://npti.gov.in/training-trainers

S.No.	Institution Name	Govt/Private (Year of Establishment)	Number & Type of Trainings	Certification	Course Duration	Course Fees	Contact Details	Source
3	Gramin Shiksha	Govt		Theoretical or practical training for teachers and trainers. It also covers training related to course design, organization and implementation as well as the content of training activities, i.e. imparting knowledge, know-how and skills.	18 hrs.	INR 5000	SCF 9-10,MODEL TOWN, BEHIND BUS STAND, FATEHABAD-125050 +911667-220114, 99968 11114	https://graminshiksha.com/NIESBUD/Training-of-Trainers(TOT)-2-2
4	Sadhana Centre for Management & Leadership Development (SCMLD)	Private	1	Certified Trainer' (Training of Trainers) Program Assessment & Certification by the Management & Entrepreneurship and Professional Skills Council (MEPSC), a Sector Skill Council (SSC), National Skill Development Corporation, Ministry of Skill Development And Entrepreneurship, GOI, under the Skill India Mission.	3+1 days non-residential (3 days training followed by 1 day for assessment)	-	392 A, Mahale Plot, Deep Bungalow-Vetal Chowk Road, Model Colony P.O. Pune 411 016 +91 020 65200482 / +91 9552590074 info@scmld.org	https://scmld.org/certified-trainers-training-of-trainers-program/
5	Indian Society for Training & Development (ISTD)	Govt (1970)	1	Diploma In Training & Development	18 months	Rs. 45,000/- + 18% GST (Rs 8,100/-)	Training House, B-23, Qutab Institutional Area, New Delhi - 110 016 Phone: 011-49077807 / 26857157 Email: info@istd.co.in, diploma@istd.co.in	https://www.istd.co.in/common_documents/Admission_Form.pdf https://www.istd.co.in/diploma-program/
6	Media & Entertainment Skills Council (MESC)	Govt (2012)	1	There are two kinds of ToT models available for trainers: • ToT for a New trainer • ToT for an Existing Trainer.	10 days	NSDC Funded Partners and Government Institutions – INR95,000 Non-NSDC Funded Partners – INR 110,000	522-524, 5th Floor, DLF Tower A, Jasola, New Delhi - 110025 +91 9953118970 011 49048335 | 49048336 info@mescindia.org	https://mescindia.org/tot.php https://mescindia.org/images/pdf/training-partner-form.pdf
7	National Skill Development Corporation(NSDC)	Govt (2008)	2	Training of Trainers (ToT) and Training of Assessors (ToA)	-	-	301, 3rd Floor, West Wing, World Mark 1, Asset 11, Aerocity New Delhi – 110037 Tel: +91-11-47451600-10	https://nsdcindia.org/international-training-and-assessment-course-itac https://nsdcindia.org/about-takshashila
				International Skills Training Courses for Trainers and Assessors (ITAC)	10 days			
8	Retailers Association's Skill Council of India	Govt1	1	Training of Trainers- RASCI Certified	10 Days	INR 5000	703-704 Sagar Tech Plaza - A, Andheri-Kurla Road,	https://rasci.in/TTT-Normal.php

S.No.	Institution Name	Govt/Private (Year of Establishment)	Number & Type of Trainings	Certification	Course Duration	Course Fees	Contact Details	Source
							Sakinaka Junction, Sakinaka, Andheri (E), Mumbai-400 072. Tel: +91-22-40058210-5 Email: info@rasci.in	
9	Centre For Training & Professional Development (CTPD)	Private	1	Professional Diploma in Train the Trainer	5 months	INR 20,000	SAI PREMA', 1st Floor, Christ Lane, No.39, Krishnanagar Industrial Area, Near Forum Mall, Koramangala, Hosur Road, Bangalore – 560 029	https://www.trainertrainingcourse.com/professional-training.php
10	Master Trainer Certification Program	Private	1	Master Trainer Certification Program	4 days		DHI Innovation park, Bannerghatta Main Road Bangalore, INDIA info@indianleadershipacademy.com Contact : +91 9620420270 / 7624971571	https://indianleadershipacademy.com/trainercertification/#:~:text=Train%20The%20Trainer%20Certification%20Program%20at%20Indian%20Leadership%20Academy%20is,started%20on%20the%20training%20journey.
				Train The Trainer Certification Program	7 days			
11	The Knowledge Academy Ltd	Private (2009)	1	Train the Trainer Course	2 days 8 hours	INR 57695	T: +91-181-5047001 E: info@theknowledgeacademy.com	https://www.theknowledgeacademy.com/in/courses/train-the-trainer/#topicData
12	Bodhih	Private (2008)	1	Master Trainer Certification	5 days	-	Mobile Number -+91 99000 11601/+91 98807 43332 Email Address solutions@bodhih.com	https://bodhih.com/contact-us/
13	Bookmytrainings.com Pvt. Ltd.	Private (2011)	6	The 'Professional Online Trainer (TTT)' Program (ISTD Certified Course)	5 days			
				Certified Master Trainer and Facilitator Program	-			

S.No.	Institution Name	Govt/Private (Year of Establishment)	Number & Type of Trainings	Certification	Course Duration	Course Fees	Contact Details	Source
				Train The Trainer Program	2 weeks			
				NLP Trainer Training	-			
				The Magic of Making Training Fun !!	2 hrs			
				Train the Trainer Program	2 hrs			
14	Cubezoid Solutions Pvt. Ltd. (Vskills)	Private	1	Certified Train the Trainer	1 hr	INR 3499	Vskills 1113, Tower - 2, Pearls Omaxe, Pitampura,New Delhi, Delhi 110034 Telephone-011 4734 4723	https://www.vskills.in/certification/index.php?route=information/contact
15	Sevenmentor & Training Pvt. Ltd.	Private	1	Train The Trainer (TTT)	22 hrs	-	Shivaji Nagar Head Branch 21 & 25/A Wing, Shreenath Plaza, 1st floor, Dnyaneshwar Paduka Chowk, 1184/4 F.C Road, Shivaji Nagar, Pune, Maharashtra – 411005 Ph. No.- 7798058777	https://www.sevenmentor.com/train-the-trainer-course-pune.php#
16	Blanchard Research & Training India LLP	Private (2008)	1	Train the Trainer Certification India	-	-	Unit No. 629-634, 6th Floor, Vipul Trade Centre, Sohna Road, Sector – 48,Gurgaon – 122018, Haryana(India) Toll Free: 1800-102-1345 Phone: +91-124-2666030 E-mail: info@blanchardinternational.co.in	https://blanchardinternational.co.in/train-the-trainer-certification-india/
17	Indian Academy of Training and Development IATD	Private	1	Master Diploma In Training And Development	4 months	INR25000	Phone number - /+91 9739995336+91 9739995446	https://iatd.co/online-diploma-in-training-and-development/
18	Tuv India Pvt Limited	Private	1	Train The Trainer Program	9 hrs	INR 10000/- + 18 % GST Only	801, Raheja Plaza - 1 L.B.S Marg, Ghatkopar (W) Mumbai 400 086	https://www.tuv-nord.com/in/en/services/tuv-india-training-

S.No.	Institution Name	Govt/Private (Year of Establishment)	Number & Type of Trainings	Certification	Course Duration	Course Fees	Contact Details	Source
								academy/tuv-india-online-training-services/train-the-trainer-program/
19	NLP Coaching Academy	Private (2008)	1	Train the Trainer Certificate under International Board of Behavioral Trainer (IBBT)	4 days	INR35000 +GST	Bannerghatta Road: Muthurayya Swamy Layout: Bengaluru: 560076 Email: info@nlpcoach.in Phone: +91-9841619669	https://nlpcoach.in/train-the-trainer/#1572516053398-a1b7c04c-5353

Annexure II: List of stakeholders consulted

S.No.	Name of organization	Type of organization/sector	SPOC Name	Designation
1.	Institute of Hotel Management	Institute	Mr. Amitabh Dey	Principal
2.	Indian Institute of Entrepreneurship	Institute	Dr. Abhijit Sharma	Director
3.	Assam Downtown University	Institute	Mr. Joutishman Dutta	Managing Trustee, Downton Charity Trust
4.	Indian Institute of Handloom Technology	Institute	Ms. Niva	Lecturer
5.	Indian Institute of Technology (IIT) Guwahati	Institute	Ms. Chitralekha Mahanta	Dean of Academic Affairs
6.	North East Institute of Fashion Technology	Institute	Ms. Tanya	Trainer
7.	Industrial Training Institute (ITI)	Institute	Mr. Narool Hussain Majumdar	Principal
8.	Tezpur University	Institute	Ms Joya Chakraborty	HOD, Mass communication & Journalism
9.	Assam Agriculture University	Institute	Dr Jayanta Deka	Dean, Faculty of Agriculture
10.	National Institute of Design, Jorhat	Institute	Mr. V Ravishankar	Professor
11.	Tocklai Tea Research Institute	Institute	Dr. Ranjan Bhuyan	Professor
12.	VLCC	Beauty & Wellness	Mr. Anil Dahiya	Lead Govt. Relations
13.	Royal Orchid Hotels	Tourism and Hospitality	Mr. Amlan	Head Training
14.	Bird Group	Tourism and Hospitality	Mr. Rohit Aggarwal	Director Strategic Partnerships
15.	Toonz Media Group	Media, Entertainment and Communication	Mr. Sasikumar	Head: Training Operations
16.	Study team-In house expert	Mechatronics and Robotics	Mr. R.C Agnihotri	Independent Consultant
17.	Study team-In house expert	Media, Entertainment and Communication	Mr. Raman Kalra	Partner
18.	Study team-In house expert	Textile, Handloom and Handicraft, Retail	Mr. Arindam Saha	Director

19.	Study team-In house expert	Logistics and supply chain	Mr. Jaffrey Thomas	Director
20.	Study team-In house expert	Oil and Gas	Mr. Raman Jee Jha	Associate Director
21.	Study team-In house expert	Agriculture	Mr. Priyank Bhardwaj	Director
22.	Study team-In house expert	Building and Construction	Ms. Shailaja	Associate Director

Annexure III: List of WorldSkills trades

S.No.	WorldSkills Competition trades
1	Aircraft Maintenance
2	Architectural Stonemasonry
3	Autobody Repair
4	Automobile Technology
5	Bakery
6	Beauty Therapy
7	Bricklaying
8	Cabinetmaking
9	Car Painting
10	Carpentry
11	Chemical Laboratory Technology
12	Cloud Computing
13	CNC Milling
14	CNC Turning
15	Concrete Construction Work
16	Construction Metal Work
17	Cooking
18	Cyber Security
19	Electrical Installations
20	Electronics
21	Fashion Technology
22	Floristry
23	Freight Forwarding
24	Graphic Design Technology
25	Hairdressing
26	Health and Social Care
27	Heavy Vehicle Maintenance
28	Hotel Reception
29	Industrial Control
30	Industrial Mechanic Millwright
31	Information Network Cabling
32	IT Network Systems Administration
33	IT Software Solutions for Business
34	Jewellery
35	Joinery
36	Landscape Gardening
37	Manufacturing Team Challenge
38	Mechanical Engineering Design - CAD
39	Mechatronics
40	Mobile Robotics
41	Painting and Decorating
42	Patisserie and Confectionery

43	Plastering and Drywall Systems
44	Plastic Die Engineering
45	Plumbing and Heating
46	Polymechanics and Automation
47	Print Media Technology
48	Prototype Modelling
49	Refrigeration and Air Conditioning
50	Restaurant Service
51	Visual Merchandising
52	Wall and Floor Tiling
53	Water Technology
54	Web Technologies
55	Welding
56	3D Digital Game Art

Source: WorldSkills International website

Annexure IV: Sample of WorldSkills Specification Standard for Welder trade

Section		Relative importance (in %)
1.	**Work organization and management**	**5**
	The individual needs to know and understand: • The standards and regulations relating to health and safety, security, and hygiene within the construction metal industry • The precautions and methods of operation for common hand tools • The precautions for the safe use, maintenance, and adjustment of mechanical and thermal cutting equipment • The safe use, adjustment, and maintenance of mechanical and hand bending and forming equipment • The requirements and possibilities for environmental management and sustainability within the industry • The selection, use, and maintenance of the range of Personal Protective Equipment used in the construction metalwork industry	
	The individual shall be able to: • Work safely with regard to self and others • Maintain a safe and clean working environment • Use hand and power tools safely • Use and adjust thermal and mechanical cutting and shearing equipment safely • Use and adjust hand and mechanical bending and forming equipment • Carry out work with consideration to the environmental and sustainability issues relating to the industry • Select and use appropriately the relevant personal protective equipment appropriate for the task	
2.	**Communication and interpersonal skills**	**5**
	The individual needs to know and understand: • The roles and requirements of customers, architects and design engineers, and related tradespersons, and effective methods of communication • Detailed instructions from customers, architects, design engineers, and Engineering Supervisors. • Non-verbal communication such as drawings, guidelines, international standards, etc. • The importance of good teamwork	
	The individual shall be able to: • Interpret and implement the customer's brief • Clarify any possible misunderstanding in the drawing by asking the relevant questions • Read and use all necessary manuals, drawings, guidelines, etc. to achieve a good result of the work • Work effectively as a member of a team	
3.	**Marking out techniques**	**10**
	The individual needs to know and understand: • First and third angle orthographic projection • Drawing and welding symbols used on engineering drawings • ISO standard numbers • Mathematical calculation and unit translation • Geometrical development methods and practice • The selection, use, and maintenance of measuring and checking equipment • The differences between a cutting list and a material list • The techniques of flat pattern development • Structural joint connection types • Methods of interpreting and using information and instructions for production • Tolerances and their relationship to accuracy	
	The individual shall be able to: • Interpret engineering drawings and symbols • Perform standard mathematical calculations including areas, volumes, and unit conversion	

	• Select and use measuring equipment • Prepare a comprehensive materials list • Develop and cut patterns using parallel, radial, and triangulation methods • Mark out, form, and assemble construction joint connections • Carry out cutting and assembly using production instruction to given tolerances	
4.	**Cutting techniques**	**10**
	The individual needs to know and understand: • The selection, use, and maintenance of mechanical equipment used such as shears, corner shears, guillotine, saws, and grinders • Processes for cutting/grinding materials to given tolerances • The selection and use of thermal cutting equipment to include Oxy-Acetylene torch, cutting wheels, guides and circle cutters • The techniques for punching, countersinking, drilling, tapping, and reaming holes in a variety of metals and non-ferrous materials	
	The individual shall be able to: • Use power tools and mechanical methods to cut/shear materials to given tolerances • Use thermal cutting equipment to cut low carbon steels using manual cutting wheels, straight edges, and circle cutters and guides • Use hand and power tools to cut, punch, drill, countersink, tap, and ream holes in a variety of metals	
5.	**Forming techniques**	**15**
	The individual needs to know and understand: • The adjustment and operation of manual or mechanical forming machines • The adjustment and operation of brake presses • The adjustment and operation of pinch and pyramid rolls • The selection, adjustment and maintenance of oxy-acetylene gas heating equipment • The adjustment and operation of flat bar benders • The adjustment and operation of manual and mechanical folders	
	The individual shall be able to: • Use manual or mechanical forming machines to cold form metals • Adjust and use oxy/acetylene equipment to hot form plate and section • Bend low carbon steels using a flat bar bender • Use manual or mechanical break presses or folders to shape low carbon steels, stainless steels, aluminium, and alloys • Use pinch and pyramid rolls to produce required shapes • Use a mechanical brake press or folder to produce straight bends to any angle	
6.	**Assembly and finishing techniques**	**35**
	The individual needs to know and understand: • Assembly techniques and symbols used in engineering drawings and project descriptions • The use of hand and power tools for assembly • The types, selection and operation of pivot and locking devices in common use • The range of mechanical fastenings used in the construction metalwork industry including: Rivets; Nuts and bolts; Locking and flat washers; Screws; Manufacturers mechanical fasteners • The range of edge, surface and joint finishes available • The range of tools used to achieve required finishes • The use of standard techniques for checking dimensional stability	
	The individual shall be able to: • Use correct assembly skills as required • Select and use hand and power tools for assembly • Construct moving pivots and locking devices as required • Select and place and fix mechanical fittings as required for assemble • Finish project edges, surfaces and joints as required using hand and power tools to include: Files; Wire brushes; Abrasives; Deburring tools • Use non-chemical weld cleaning techniques • Check structures for accuracy, square, and flatness	
7.	**Welding and joining techniques**	**20**
	The individual needs to know and understand: • The selection and use of Welding processes including:	

	• Manual metal arc welding (111); Gas metal arc welding (135); Gas Tungsten arc welding (141) • The range of welding consumables available, their selection, and storage • Polarities adopted for welding processes • Preparation techniques prior to welding • Weld faults and rectification	
	The individual shall be able to: • Select, adjust and use manual metal arc welding equipment to produce welded joints in steel • Select, adjust and use manual metal arc welding equipment to produce joints in low carbon steel and stainless steels • Select, adjust and use gas metal arc welding equipment to produce joints in low carbon steel and stainless steels • Select, adjust and use gas tungsten arc welding equipment to produce joints in stainless steels, aluminium and aluminium alloys with no need for weld penetration. • Select welding consumables to suit position, weld polarity and type of material: o MMAW (111) Carbon steel - E6013, S/S-E304L, E309L o GMAW (135) Carbon steel - E70S6 o GTAW (141) Carbon steel - ER70S2, S/S – E304L, E308L and Aluminium welding • Remove surface contamination and prepare joint for welding regarding, type, and material thickness • Interpret weld position standards to ISO standards (Sys A) o PA/1G o PB/2F • Identify and repair weld faults	

Annexure IV: Best practices for pre-selection strategies

Some of the best practices referred for developing the above listed strategies are presented in the table below:

Table 35: Selective best practices for pre-selection strategies

Social Media platforms by Bhartiya Skill Development University (BSDU)[359]

BSDU was incorporated under the Act of State Govt of Rajasthan, BSDI us a private skill university of India. It extensively leverages social media platforms to connect with larger audience. Key pointers to be noted are:

- **Focus on Brand:** Time lapse videos and blogs highlighting the repute of brand name
- **Live Streams**: Q&A sessions, cultural events, guest lectures through Facebook Live, Instagram Stories, Video Chat for Snapchat, and Periscope for Twitter
- **Blogs on Differentiators**: Stipend during internship, Dual training model, Multiple entry and exit system, etc.
- **Success Statistics**: Focus on placements indicators & career progression
- **Research:** Patent filing and Funding for research from renowned industries

Information Sessions by Shiv Nadar University [360]

Shiv Nadar University offers a full range of academic programs at the undergraduate, postgraduate and doctoral level. The Office of Admissions conducts information sessions across major cities in the country. Key pointers to be noted are:

- **Opportunity to know more** about the University including its academic rigor, research, multidisciplinary curriculum, campus life, clubs and societies, scholarships, and more
- **Easily accessible link on website** to make students register for information sessions
- **Provides virtual tours** to campus to get the feel of campus culture; witness first-hand state-of-the-art infrastructure; meet students; interact with the faculty; and experience life on campus.

Entrepreneurship Drives by IIT Bombay[361]

IIT Bombay conducts “Eureka” which is Asia's Largest Business Model Competition every year which provides a platform for ideas and early-stage start-ups to evaluate business potential. Key pointers to be noted are:

International recognition for institute and courses

- Selected ideas are provided **5 months on campus incubation support** and cash prices
- **Holistic support** in incubation value chain offered is offered; seed funding, mentoring, networking, market outreach, development of MVP, validation, professional services, and sustainability
- For ventures that cannot sustain themselves as stand-alone businesses, the institute helps with **filing patents**

[359] https://ruj-bsdu.in/
[360] https://snu.edu.in/home
[361] https://www.ecell.in/eureka/

and licensing the technology to the industry; developers to retain 70% of the license fee

Webinars by Indian School of Business (ISB)[362]

Established in 2001, ISB is a private business school which offers post-graduate management programs in its two campuses in Hyderabad and Mohali. ISB uses interactive all year-round webinars from to spread awareness and facilitate admission processes. Some of the key aspects covered during webinars are:

- **Eligibility:** Average cut off, Minimum work experience, course wise prerequisites, etc.
- **Alliances**: Kellogg, Wharton, LBS & MIT
- **Faculty & Curriculum**: World class teachers through portfolio faculty model to provide global exposure with market aligned curriculum
- **High Diversity**: Gender, Profession Background & Extracurriculars
- **High Placements**: Year wise increasing trends (Av. 26 LPA in 2020), partnered firms for placements
- **Alumni Network**: 12,000+ alumni in 60+ countries

[362] https://www.isb.edu/en.html

Annexure V: Potential industry partners for schools

Potential schools	Focus areas	Potential Industry partners
School of Agricultural and Food Technology	**Agriculture and Food Technology**	• Hindustan Unilever Ltd • JK Agri Genetics Ltd • Kohinoor Foods Ltd (Satnam Overseas Ltd) • MTR Foods Pvt Ltd (Orkla) • Raghuvansh Agrofarms Ltd
	Tea	• Tata Tea • Goodricke Group Ltd • Red Label Tea • Wagh Bakri • Lipton • Tetley • Dilmah • Twinings
	Bamboo Technology	• Rhino Bamboo Industry • Shanghai YingXin Industrial Co. Ltd • Luit Nirman
	Horticulture (including spices)	• Godrej Agrovet Ltd • Goodricke Group Ltd • Tripura Forest Development and Plantation Corporation Ltd • Novo Agritech Ltd • Osaw Agro Industries Pvt Ltd
	Animal Husbandry, Sericulture and Fisheries	• AngelPlus Foods • Aqua Sea Food India • Alltech • RGS Feeds • Nutrikraft India
School of Technology	**Information Technology**	• Infosys • Wipro • Dell • Accenture • Oracle • Microsoft • IBM
	Data Analytics, AI and Cloud	• Absolutdata • Fractal Analytics • BRIDGEi2i Analytics • Accenture • Genpact
	New age Technologies	• Cisco • Schneider • Google • PTC • SMC • Amazon • NASSCOM

Potential schools	Focus areas	Potential Industry partners
School of Design and Creativity	**Design**	• Shahi Exports • Orient Craft • Arvind Limited • Texport Garments • Banswara Garments • Brandix Limited
	Media and Communication Studies	• Credence Sound and Vision • Saregama India Limited • Filmcity Media • Zee Televisions • Metropolitan Media Company • Toonz Media Group • Techniclor (animation, visual effects) • Deluxe ((animation, visual effects) • Digital Content Creation- AWS, Google Cloud • Subhash Ghai School, Whistling Woods • Marwar studios for film making
School of Manufacturing and Construction	**Mechatronics and Robotics**	• KUKA Robotics India Pvt. • Mechatronics Systems Private Limited • SMC • UiPath • Siemens • Menzel Vision & Robotics Pvt. Ltd • Masibus Automation And Instrumentation Pvt. Ltd • Mercedes Benz • Skoda
	Engineering	• Tata Group • Reliance Industries • Godrej • Larsen & Toubro (L&T) • Havells India Limited • BHEL
	O&G	• Indian Oil Corporation Limited • Oil & Natural Gas Corporation Limited/ ONGC Academy • Reliance Industries Ltd. • Engineers India Ltd. • Vedanta-Oil & Gas Business • GAIL • Bharat Petroleum Corporation Ltd. • MECL • GSI
	Electronics	• Bharat Heavy Electricals Limited (BHEL) • Honeywell International • Mitsubishi Electric • Schneider • LG Electronics
	Metal technology	• Nippon Steel & Sumitomo Metal Corporation

Potential schools	Focus areas	Potential Industry partners
		• Kobe Steel • Hyundai • Tata Steel • JFE Steel Group
	Building and Construction	• Credai • Stellar Group • Ambuja Cement • L&T Ltd • Kumar Buildcon Pvt.Ltd. • Simplex Infrastructures Limited • Schneider • Kone elevator India Pvt. Ltd • Otis
School of Sustainability	**Climate change, Environment and Sustainability**	• Konark Energy Solutions LLP • IT Power Private Limited • Suyaash Infracon Pvt Ltd. • Greenzone Engineering Pvt. Ltd. • Saitech Energy Space Systems Pvt. Ltd. • Ikea • L&T from the building perspective
School of Mobility	**Logistics and Supply Chain**	• DHL • FedEx • CII Institute of Logistics • Cargill • Mahindra Logistics, Transport Corp of India, Future supply Chain GATI
	Ports and Inland Water Transport	• Inland Waterways Authority of India • The Shipping Corporation of India • Global Offshore Services Ltd.
	Civil Aviation	• GMR • InterGlobe Aviation • Vistara, etc.
School of Management and Finance	**Management**	• Management consulting firms • Sporty Solutionz • Rhiti Sports • Israel Agro Consultant • Universal Consulting India • Infinity Celebrity management • Panache Entertainment and Events
	Banking, Insurance and Financial Services	• Kotak Bank Limited • Life Insurance Corporation of India • Edelweiss Financial Services Ltd. • Tata AIG General Insurance Company Ltd. • Axis Bank Limited • ICICI Prudential Asset Management Company Limited • Paytm • Mobikwik

Potential schools	Focus areas	Potential Industry partners
School of Tourism, Hospitality and Wellness	**Tourism and Hospitality**	• Taj • Radisson • Novotel • SOTC • Cox and Kings • Aquaterra Adventures • Royal Orchid Hotels • Bird Group
	Wellness	• Orane • VLCC • LabourNet • CavinCare • Lakme Studio • Sumit Israni • Shehnaaz Husian
School of Healthcare	**Healthcare and Health Technology**	• IQVIA • Apollo Hospital Enterprise Ltd • Fortis • Dr. Reddy's Laboratories Ltd • Portea Healthcare (Home healthcare) • Medwell Ventures

ASSAM SKILL DEVELOPMENT MISSION

Katabari, DPS Road, NH-37

Garchuk, Guwahati-781035 (INDIA)