



GOVERNMENT OF KERALA  
KERALA STATE PLANNING BOARD

**THIRTEENTH FIVE-YEAR PLAN  
(2017-2022)**

**WORKING GROUP ON  
TECHNICAL EDUCATION**

**REPORT**

SOCIAL SERVICES DIVISION

KERALA STATE PLANNING BOARD  
THIRUVANANTHAPURAM

MARCH 2017

## *PREFACE*

In Kerala, the process of a Five-Year Plan is an exercise in people's participation. At the end of September 2016, the Kerala State Planning Board began an effort to conduct the widest possible consultations before formulating the Plan. The Planning Board formed 43 Working Groups, with a total of more than 700 members – scholars, administrators, social and political activists and other experts. Although the Reports do not represent the official position of the Government of Kerala, their content will help in the formulation of the Thirteenth Five-Year Plan document.

This document is the report of the Working Group on Technical Education. The Chairpersons of the Working Group were Sri. B. Srinivas IAS and Dr R.V.G. Menon. The Member of the Planning Board who coordinated the activities of the Working Group was Dr B. Ekbal. The concerned Chief of Division was Smt. Shila Unnithan.

Member Secretary

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*CHAPTER 1*  
*INTRODUCTION*

1. Technology is considered as the application of scientific principles to invent things useful to the society or to solve real world problems. It is the application of mathematics, science and arts for the benefit of life. Technical education should aim at human resource development by way of application of technology for the benefit of the society, in terms of improving the quality of life, enhancing industrial productivity and improvising technologies for the overall development of the community. The focus of technical education should be to impart education to young generation enabling them to contribute to the sustainable development and improvement of quality of life of the society. The major goals of technical education can be outlined as follows:
  1. To train youngsters as responsible citizens to enable them meet national and global challenges by offering quality education, including professional training, which combines high-level knowledge and skills, through courses and content continually tailored to the present and future needs of society.
  2. To provide opportunities for higher learning and lifelong through an optimal range of choices, and flexibility of entry and exit options within the system, as well as an opportunity for individual development and social mobility for active participation in the society, with a broader vision.
  3. To advance, create and disseminate knowledge and expertise through research and extension activities, as part of its service to the community, and assist societies in cultural, social and economic development.
  4. To contribute to the development and improvement of education at all levels, including through training of teachers.

*Key Initiatives in the 12th Five-Year Plan*

*Establishing Kerala Technological University*

2. The Major objective of establishing APJ Abdul Kalam Technological University (KTU) is to improve the academic standards of undergraduate, graduate and research programmes in Engineering and Technology. All the AICTE-approved Engineering Colleges are affiliated to the KTU.

*Transportation Engineering Research Centre (TRC)*

3. The TRC was set up in College of Engineering, Thiruvananthapuram, for transfer of technology in transportation engineering to the field, and to encourage applied research to solve the various transportation problems being faced by the State such as unscientific and poor condition of roads, increasing accidents etc. The main objective of the Centre is to ensure better planning and to lay roads using alternate materials. In order to conduct high quality research in transportation sector, TRC provides an extensive array of labs, equipment and reference materials. So far, the TRC had undertaken 16 projects which were executed by PWD.

### *Strengthening the Libraries in Engineering Colleges and Polytechnic Colleges*

4. Digital libraries were set up in select Engineering Colleges and Polytechnic Colleges under the Scheme. The scheme envisaged automation and digitization of libraries in all the institutions, making online journals available to institutions, purchase of text books/study materials in digital format, etc. Steps were taken to extend the scheme to Fine Arts Colleges and Technical High Schools during 2016-17.

### *Educational Resource Centres in All Engineering Colleges*

5. The 'Institutional Repositories' and 'e-learning systems' have been identified as essential infrastructure for any organization in the Digital Age. The knowledge/learning management system supports the creation, organization, storage, dissemination and preservation of the digital information assets of its Engineering Colleges and Polytechnic Colleges. The objective is expected to be met through a knowledge network under the directorate. The repository was established to facilitate the deposit of digital content of scholarly nature created by the faculty and students. This system includes materials such as research journal articles, digital versions of thesis and dissertations, administrative documents, course notes, or learning objects. Steps are taken to develop content in all subjects and create a repository of all research work, expert lectures and video conferencing done in institutions.

### *Research Scholarship in All Engineering Colleges*

6. Under the department, research scholarships were awarded in all engineering colleges to Ph.D. scholars and to M.Tech. students to improve the research ambience. The approximate number of beneficiaries (state-wide) in 2015-16 is 300 students pursuing M.Tech. and 30 Ph.D. scholars in addition to GATE qualified candidates.

### *Faculty and Staff Development Training Centres*

7. In the year 2012-13, Faculty and Staff Development Centres were started in College of Engineering Thiruvananthapuram, and Govt. Engineering College, Thrissur, in order to impart training to the faculty and staff of Technical Education department. Programmes one-governance, office proceedings, awareness on service rules, personality development, etc. were also offered. Faculty and Staff Development Training Centre at Govt. Engineering College, Kannur started functioning during the year 2016-17. Training Need Analysis was carried out and the training programs were designed accordingly.

### *Scholar Support Programme*

8. For the past few years, the pass percentage of engineering students admitted through reservation quota for SC/ST has gone down considerably. Students coming from rural areas with poor economic background are also experiencing difficulties in understanding tough subjects of the program. Thus, the need for providing remedial coaching to them was felt.

Consequently, a scheme for providing remedial coaching was implemented since 2012-13 in polytechnic Colleges and Engineering Colleges.

*Quality Improvement Program (QIP) Centres in Three Engineering Colleges*

9. QIP centers have been started in 4 branches in CET, 3 branches each in GEC, Thrissur and RIT Kottayam, with intake of 2 faculty per branch, wherein the faculty of Engineering Colleges were provided the opportunity to undergo Ph.D. programmes. Every year, around 20 faculty could avail the opportunity to undergo Ph.D. programmes through above Centers. Steps were also taken to improve the existing laboratories, workshops, library facilities etc. Residential facilities for the QIP research Scholars and apartments for faculty are also under construction.

*Additional Skill Acquisition Programme (ASAP)*

10. This Programme has been started in 2012-13, by organizing short-term skill development programmes for unemployed and financially backward youth. The infrastructure facilities, faculty, machines and tools available in engineering colleges have been put to use for training the stakeholders in the surrounding areas in different fields of technology. The trainees were given tool kit, paid monthly stipend and awarded Certificate of Competency after successful completion of the program.

*New Indian Institute of Technology (IIT) in Kerala*

11. An institute of national repute functioning within the state is expected to motivate the students. Accordingly, MHRD, GOI, has established an IIT at Palakkad. Majority of the 500 acres of the land identified for the permanent campus of IIT, Palakkad, has been acquired. The first batch classes in 4 disciplines have started in August 2015.

*Trivandrum Engineering Science and Technology Research Park (TrEST)*

12. The objective of TrEST Research Park was to enhance Industry Institute Interaction and to promote fundamental and applied research. It is a non-profit making facility provider attached to the College for providing facilities to industries to start research centers. Accordingly, TrEST was registered as a charitable trust and Board of Governors was constituted. However, the infrastructure is yet to be created. TrEST Research Park is expected to interact closely with TBI centers at Engineering Colleges.

*National Vocational Education Qualification Framework (NVEQF) in Technical High Schools and Polytechnic Colleges*

13. The AICTE has launched the NVEQF to be implemented in Polytechnic Colleges, Engineering Colleges and Other colleges in the university systems from 2012-13. The Scheme envisages seven certificate levels, each certificate level with approximately 1000 hours of teaching. Anybody can avail of competency-based skill learning without losing the

possibility of changing course and moving at any certificate level into a formal system of education and vice versa. This would ultimately provide a full multi-entry and multi-exit system between vocational education, general education and the job market.

14. This system has been implemented in the department since 2013-14 in the Technical High Schools. As per the revised curriculum of Technical High Schools, NVEQF Level I and Level II Courses were implemented for Standard IX and X respectively.
15. Learning materials as per NVEQF norms were prepared for 13 specializations and handed over to the 3200 students. The staff was trained, as per NVEQF norms, in all technical subjects and English communication skills. Eighty Six staff members were trained in institutions such as ATI, FTI at Hyderabad, Guindy, Bangalore, etc.

#### *Schemes Coming Under PPP Mode*

16. The following four schemes viz. (a) Advanced Diploma in Automotive Mechatronics (ADAM) (b) Centre of Excellence in Automation Technologies (c) Centre of Competence in Automation Technologies (d) 2 year M. Tech. in Translational Engineering under TPLC, were implemented during 12<sup>th</sup> 5-year plan period.
  1. *Advanced Diploma in Automotive Mechatronics (ADAM) and establishment of Centre of Excellence in Mechatronics at GEC, Barton Hill.* A one-year Advanced Diploma in Automotive Mechatronics (ADAM) was started in GEC, Barton Hill, in collaboration with Mercedes Benz Pvt. Limited, Pune. So far two batches of 20 students have completed the course with 100% placement and the 3<sup>rd</sup> batch is underway.
  2. *Centre of Excellence in Automation Technologies in College of Engineering Trivandrum.* In the year 2013-14, a Centre of Excellence in the field of Automation Technologies, in association with M/s Bosch Rexroth, was established in CET. The stakeholders of the program were participants from industry, students of Engineering Colleges/Polytechnic Colleges/ITI/Technical School, Unemployed youth, faculty and supporting staff government Engineering/Polytechnic Colleges.
  3. *Centre of Competence in Automation Technologies in Govt. Polytechnic College, Kalamassery.* A Centre of Competence in the field of Automotive Mechatronics, in association with M/s Bosch Rexroth, has been established at Govt. Polytechnic College, Kalamassery, with necessary machinery and equipment for setting up of laboratory on Hydraulics, Pneumatics, Sensorics, PLCs and Mechatronics. The Centre is now conducting certificate course in automation technology at intermediate level of 300 hours duration with an intake of 20 students per batch.
  4. *Translational Research and Professional Leadership Centre (TPLC).* The TPLC was established at GEC, Barton Hill, Trivandrum, to propagate the concept of Translational Engineering through training and awareness programs and to offer an interdisciplinary M.Tech. Programme in Translational Engineering in collaboration with National/International institutes and Universities. In order to expose the students to the challenges of real world, a mandatory 6-week internship program has been included in the interdisciplinary M.Tech. Programme in Translational Engineering, in Universities abroad and in National Institutes.

*Issues, Concerns and Suggestions Regarding Technical Education in Kerala*

17. The advancement of knowledge through research is an essential function of all systems of higher education. Innovation, inter-disciplinarity and trans-disciplinarity should be promoted and reinforced in programmes with long-term orientation on social and cultural aims and needs. An appropriate balance should be established between basic and target-oriented research. Institutions should ensure that the academic community engaged in research is provided with appropriate exposure, resources and administrative support.
18. The rapid breakthroughs in the field of Information and Communication Technologies offer opportunities to innovate on course content and teaching methods, and to widen access to higher learning. It needs to be appreciated that Information Technology changes the role of teachers in relation to the learning process.
19. In order to achieve the aforesaid objectives, technical education institutions must be given Academic Autonomy and at the same time ensuring accountability to all the stakeholders. National eminence and international visibility are to be envisaged as the major long term goals in technical education. Quantitatively, the expansion of Technical education in Kerala has been satisfactory; however, our standing needs serious introspection on quality aspects. The requirements of quality technical education may be summarized as follows:
  1. Quality Faculty
  2. Meritorious Students with Aptitude for Engineering
  3. Adequate infrastructure including well equipped labs & workshops, libraries, ICT facilities
  4. Academia-Industry-Student linkages
  5. Skilling for enhancing employability
  6. A Vibrant campus with excellent Academic atmosphere leading to creation of outstanding technical manpower
  7. Appropriate administrative and academic governance systems
20. While our institutions have qualified faculty and meritorious students, there is a serious concern about the outcome of both under graduate and post graduate programs. Deficiency of competitive aspirations among the students and lack of drive for research among the academic community appear to be glaring short comings of the existing system.
21. Some of the specific suggestions to address the above-mentioned issues and concerns are indicated below:

*Academic Reforms*

1. A mechanism to assess the demand for professional graduates/Diploma holders, keeping in view of the local, national and global requirements, has to be put in place in order to regulate the number of institutions as well as to decide the specializations to be offered.



2. Admission Policy to Professional Programs need to be revamped taking into consideration the Academic rigor of each Program and the proportionate Caliber required from the aspirants, by putting in place suitable filtering mechanisms during the selection process. Such a policy will ensure that students' career growth, time and money are properly guided according to his/her academic strengths thus serving both individual and societal interests.
3. A suitable policy on Academic Autonomy and Accreditation to Engineering Colleges needs to be framed.
4. Huge investment should be made into the Technical Education Sector so as to strengthen the infrastructure requirements such as Smart Classrooms, Laboratories, Workshops, Libraries, Computing facilities, residential facilities, etc., and to enhance the quality of faculty.
5. Research should be promoted on a big way and weightage for research may be made part of promotion policy. A state-wise list of priority topics and areas of study, with focus on social relevance, may be identified to give a direction to the research.
6. Activities to be promoted to fill curriculum gaps and content beyond syllabus, through visiting faculty programmes and extra mural lectures. The involvement of Professional Bodies to design and update curriculum at periodical intervals has to be ensured so that the technical education system is kept abreast of the latest global developments in the field.
7. Technical education institutions should take lead in drawing on the advantages and potential of ICT wherever necessary. Open online Courses like SWAYAM and MOOCs may be utilized to the maximum by the Colleges. The KTU may also be requested to make appropriate changes in their Statutes so as to facilitate credit transfer of online courses.
8. Industry-Institute-Interaction is an important component of quality. Faculty should be encouraged to undergo industrial internship during their formative years and avail the provision for Industrial exposure at latter part of their career. Industrial internship for students may be made mandatory.
9. Periodical assessment of skilled manpower requirement needs to be conducted in consultation with the industry, and re-orient the existing courses accordingly, so as to meet the needs of both industry and job aspirants. Entrepreneurship should be made part of curriculum so as to give a fillip for startups.
10. An 'Academic Audit Mechanism' should be put in place to enhance and monitor the quality of the Technical Education in the State.
11. Centers of interdisciplinary research and development, and Product Design & Development centers in selected technical institutions to be established.
12. Make provision for utilizing expertise or service of professional counselors in all technical institutions so as to address the grievances of the students and to mould their personality.
13. Exclusive programs, for strengthening the basics and enhancing the knowledge base of academically weaker students in difficult subjects, after admission but before starting of academic sessions, and remedial measures throughout the duration of the programs, may be thought of so as to enable them to complete the programs

successfully and also to gain enough academic strength and confidence to pursue higher studies.

### *Administrative Reforms*

1. In order to ensure continuity of Research Projects and undisturbed academic activities, institution-wise recruitment of faculty is suggested. The frequent transfer of teachers from one college to another creates various problems. No faculty member can plan research contracts if she/he is likely to be transferred any time. PSC should advertise for faculty institution by institution. For example, an Asst Professor working in Idukki can come to Trivandrum only when a vacancy in Trivandrum is advertised. Then he/she can apply and compete with other aspirants. Similarly a Professorship in Sreekrishnapuram, Kannur or Idukki should be advertised and a junior faculty member from Trivandrum/Thrissur should be able to apply. But he/she should go there prepared to work there for a long time and not hope for transfer back to Trivandrum or Thrissur at the next vacancy. The special rules should be changed accordingly.
2. Faculty recruitment should be done every year and the selected faculty should be given induction training.
3. Promotions should be based on the work done during the previous five years, and not a mere PhD or long service. The publications and patents should be assessed by a competent peer group. The criteria for promotions can be three fold. (a) Teaching excellence, as evaluated through a 360° methodology (b) academic excellence, as evaluated through publications, patents, consultancy, etc. (c) Public service, in the form of serving in Expert bodies of Govt., University, etc., by publishing Technical Reports on matters of public interest, or by promoting student welfare in campus. These should be evaluated by competent bodies with external experts. The special rules should be changed accordingly.
4. Integration of Science faculty and technical faculty working in the Engineering Colleges may be effected by starting M.Sc. /Ph.D. programmes.
5. Develop selected institutes as lead institutes, with an objective to groom them to figure among the top 50 in the country and also to lead the Technical Education by mentoring other Engineering Colleges, Polytechnic Colleges and other technical and vocational institutes.

*CHAPTER 2*  
*DRAFT FRAMEWORK FOR THE NEW PROJECTS IN THE NEXT 5 YEARS IN TECHNICAL*  
*EDUCATION*

22. The draft frame work for Technical Education is prepared in three parts: Part -1 for Engineering Colleges, Part -2 for Other Technical Institutions and Part - 3 Proposal for Integration.

*Part 1*  
*Engineering Colleges*

23. The projects proposed for the Engineering Colleges are enlisted below with action plan and output indicators:

*Development of Selected Institutes as Lead Institutes (may be Named as State Institutes of Technology)*

24. *Objectives.*

1. To uplift the lead institutes into the top 50 in the country, so that they will be leading the Technical Education sector by mentoring other technical education institutions

25. *Action plan.*

1. Identify institutions that can take lead in the Engineering education scenario. Institutions with more than 25 years of existence may be chosen (CET, GEC Thrissur, GEC Kannur and RIT, Kottayam)
2. Prepare a long term plan to develop these lead institutes into national level prominence
3. Develop these lead institutes as mentoring institutions for other Engineering Colleges and Polytechnic Colleges in the vicinity. All the Engineering Colleges and Polytechnic Colleges will be linked to one of the lead institutes. The lead institutes will open their facilities, expertise and resources to the institutions to be mentored for the benefit of staff and students.
4. Lead institutes should establish MOU with national institutes to broaden research activities and to strive to be part of national level consortium projects and research initiatives.
5. Lead institutes should engage with International Institutions for uplifting the research activities and quality of education through student and faculty exchange programmes, internships and programmes similar to FLAIR (Fostering linkages in academic innovation and research) programme.
6. Establish linkage with industries in the corresponding field
7. Each of these institutes should become a Center of Excellence in any one select area, with provision for interdisciplinary research and development.
8. Facilitate R&D work by the intake of Ph.D. holders and research fellows

26. *Outcome indicators.*

1. Number of PhDs. produced and ongoing
2. Patents
3. Published papers, reports and books
4. Community services delivered

*Interdisciplinary Center for Computation and Informatics in a selected Engineering College*

27. *Objectives.*

1. R&D works related to computation and informatics such as digitization of data, data analysis, summarization etc. This will be useful for Govt. departments and other institutions for planning, policy making and further developments in each field.
2. Free and open source software development, through integrating the works of UG and PG students and research works.

28. *Action plan.*

1. Act as a platform for researchers to link with community and find computational solutions to the real life problems
2. Undertake computational and informatics works for Govt. Departments
3. Form a team of computer engineers for Free and Open Source Software (FOSS) development
4. Establish link with organizations and groups in FOSS movement
5. Conduct workshops regularly for interaction of researchers in different fields

29. *Outcome indicators.*

1. Computation and informatics related output delivered to community
2. Free and Open Source Software produced
3. No. of PhDs. produced and ongoing
4. Patents
5. Published papers, reports and books

*Interdisciplinary Center for Research and Development in One/ Two Engineering Colleges*

30. *Objectives.*

1. Facilitate a broad framework of R&D works linking technical institutes with other Universities, medical education, agricultural sector, sports institutes like LNCP, etc.
2. Provide technical solutions to real life problems in diverse fields
3. Act as a platform for inter disciplinary research integrating various disciplines

31. *Action plan.*

1. Form a consortium of experts and Institutions in the diverse fields involved
2. Formulate a framework for facilitating interdisciplinary research
3. Develop infrastructure facilities required for the center
4. Facilitate R&D work by intake of Ph.D. holders and research fellows

32. *Outcome indicators.*

1. Technical solutions provided for problems from diverse fields
2. Community services delivered
3. No. of PhDs. produced and ongoing
4. Patents
5. Published papers, reports and books

*Product Design and Development centers in selected Engineering Colleges*

33. *Objectives.*

1. Inculcate professionalism in students through development of products for specific applications
2. Developing facilities for prototyping and development of products they design

34. *Action plan.*

1. Develop facilities for fabrication of products
2. Conduct product design workshops
3. Conduct product expo to showcase the products developed to the public, and to facilitate interaction between industry and student community
4. Establish a channel with industry through interaction so as to help students to arrive at real life problems, which will help their growth as professionals

35. *Outcome indicators.*

1. Products developed
2. Patents
3. Industry interaction

*Detailed Frame Work for the Lead Institutes to Become Centers of Excellence – Time Line*

36. *Year 1: first half.*

Goals:	Initiation of the process to become Centre of Excellence
Plan of action:	Identify the specific area for each lead institute
Responsibility:	Lead Institutes
Output indicators:	Detailed vision about the center

37. *Year 1: second half.*

Goals:	Road map for the process to establish the Centre
Plan of action:	Consultation among academicians inside and outside the institution, industry and all other stakeholders
Responsibility:	Lead Institutes
Output indicators:	Detailed action plan with time frame

38. *Year 2.*

Goals:	Development of infrastructural facilities in the Centre
Plan of action:	Establish the required lab facilities Improve the library facilities Appoint necessary staff
Responsibility:	Lead Institutes, Directorate of Technical Education, Department of Higher Education
Output indicators:	Certification by competent authority like NBA

39. *Year 3.*

Goals:	R&D development in the Centre MOU with National institutes Interaction with industries Mentoring of other institutions
Plan of action:	Identify areas for R&D work Take Ph.D. scholars and research fellows to pursue the work Establish MOU with national institutes in the specific area of focus Establish industry institute linkages Map institutions to be mentored and establish the channel to work with them First Evaluation of the projects
Responsibility:	Lead Institutes, Directorate of Technical Education, Institutions to be mentored

Output indicators: Number of Ph.Ds (produced and ongoing)  
Patents  
Published papers, reports and books  
Community services delivered

40. *Year 4.*

Goals: Community linkages for the delivery of R & D output  
Improvisation based on evaluation at the end of 3rd year (1st evaluation)  
Exchange programmes with international institutions

Plan of action: Interaction with stakeholders to establish link with community to undertake socially relevant projects  
Developing plan of action for improvisation and act accordingly  
Continuation of R&D work  
Interaction with international institutions  
Continue mentorship program  
Second Evaluation of the projects

Responsibility: Lead Institutes, Directorate of Technical Education, Institutions to be mentored, Local Self Government and community organizations

Output indicators: No. of Ph.Ds(produced and ongoing)  
Patents  
Published papers, reports and books  
Community services delivered

41. *Year 5.*

Goals: Improvisation based on evaluation at the end of 4<sup>th</sup> year (2<sup>nd</sup> evaluation)

Plan of action: Developing plan of action for improvisation based on evaluation and act accordingly  
Continuation of R&D work, Interaction with international and national institutions, mentorship programme and community linkage

Responsibility: Lead Institutes, DTE, Institutions to be mentored, Local Self Government and community organizations

Output indicators: No. of Ph.Ds. produced and ongoing  
Patents  
Published papers, reports and books  
Community services delivered

*Part - 2*  
*Frame Work for Technical and Vocational Education in the State*

*Common Recommendations*

1. State Skills and Employment Policy to be developed.
2. Develop and adopt a Quality Assurance Framework in line with NSQF.
3. Develop a Professional and Career Development Policy (PCD) for Technical and Vocational Education Training (TVET) managerial and academic personnel.
4. Formation of a bridge organization to relate R&D institutes and vocational education system. It would help the vocationally trained person to get the benefits of R&D
5. A central vocational training standardization system, accredited nationally and globally, for maintaining the quality of the vocational education can enhance credibility of vocationally trained persons in the industry.
6. Training need analysis should be done taking into consideration job potential in local and global perspective. Creating job opportunities regionally can help maintain the equilibrium in future days for ensuring inclusive socio-economic growth.

*General framework for policy decisions*

42. *Short term targets.*

1. Collect and analyze data about labour market needs, Both locally and globally, for framing the policy
2. Establish governance and supporting structures for technical vocational education and training
3. Set the vision and goals for the TVET system
4. Initiate design of occupational standards, curricula, and basic qualification/eligibility requirements, with involvement of all stake holders
5. Incorporate soft skills and practical learning into the school-based curriculum through workshops and internships
6. Set requirements for TVET teachers

43. *Medium term targets.*

1. Draft and enact TVET legislation
2. Align secondary and tertiary TVET curricula to support transitions for students seeking further education
3. Expand vocational program offerings in new occupations, in consultation with stakeholders
4. Design and pilot formal apprenticeship programs

44. *Long term targets.*

1. Expand apprenticeship programs, if pilot efforts are successful



2. Establish a process to review occupational course offerings and vocational education and training programs
3. Design and establish guidance and counseling programs for students
4. Develop means to better prepare TVET teachers

45. *Polytechnic college stream.*

1. A labour market information system should be established, and research on vocational training strengthened. The following methods can be used to identify skills in demand:
  1. Participation by stakeholders in articulating skill set requirement and skill gap identification.
  2. Establishment of capacity to analyze market trends in terms of job creation and absorption, wage levels, waiting time for employment, etc.
  3. Periodic assessment of employment opportunities of technically qualified manpower and modification of curricula in tune with the needs of the industry from time to time.
  4. Efficient dissemination of information to public about employment trends.
2. Public-private partnership has to be strengthened.
3. Special emphasis should be given to training of trainers and other staff associated with skill development programs
4. Mechanism for quality assurance and accreditation should be strengthened.
5. Modularization and multi-skilling of programs need to be carried out.
6. A policy initiative by the government to encourage industries in SEZ to absorb a fixed number of apprentice trainees every year and/or to include III activities under mandatory CSR initiatives for these industrial houses.
7. Social acceptance of diploma courses is shrinking and awareness on the career opportunities of diploma holders need to be given to the public. This can attract students with genuine technical aptitude to the stream resulting in better workforce.

46. *Technical high schools.*

1. To attract more students from school level, reorientation of vocational courses is needed.
2. At present, Technical High Schools impart vocational training equivalent to 10<sup>th</sup> standard. The Reforms Committee, constituted to study the functioning of the THS, has strongly recommended for upgrading the Technical High Schools to Technical Higher Secondary Schools, a technical course equivalent to 12th standard. By this action the students in this stream can opt for Polytechnic education after 10th or pursue Higher Secondary Education to secure admission for engineering degree courses.

47. *GIFDs/GCIs.* Skills based education is marred by multiple access barriers like limited infrastructure facilities, quality of training, rigid entry requirements, lack of financial support and negative perceptions. These shortcomings exist more for the marginalized and disadvantaged, especially women and socially backward communities. GIFDs and GCIs

address the issue of unemployment by imparting job-oriented training and promoting self-employment initiatives.

1. Both the streams should be included in the policy document of the district panchayaths.
2. The district panchayaths should ensure provisions for adequate infrastructure including basic amenities.
3. Provision of plan fund to improve the academic environment should be made available.
4. Periodic curriculum revamping and co-curricular activity design in line with premier institutions like NIFT.
5. Production Centres should be planned for GIFD to promote entrepreneurial drive
6. Talent demonstration activities, including exhibitions, to be included in the co-curricular activities, to be supported by the DTE.
7. Soft skill improvement programs to be extended to the institutions, and industrial visits should be made mandatory.

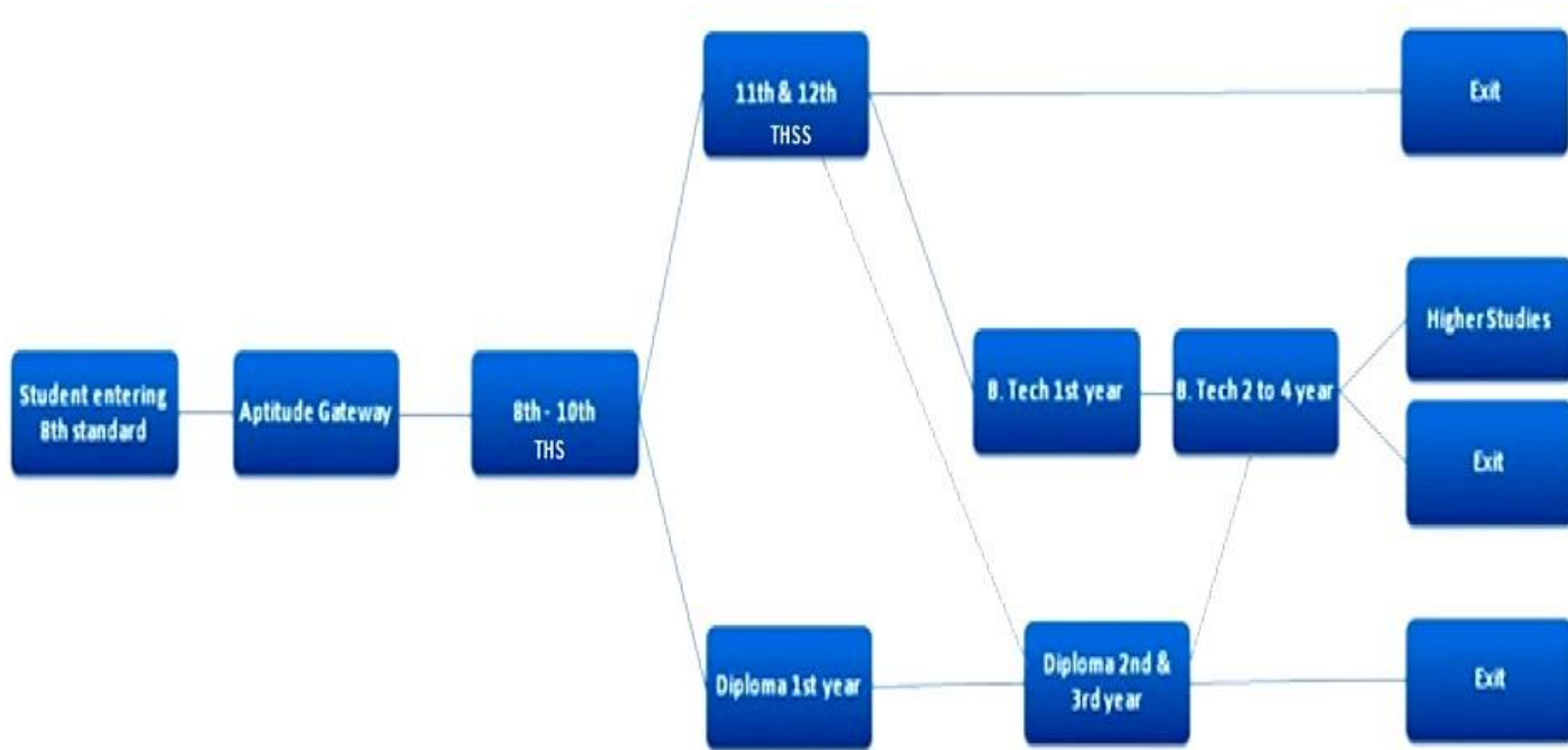
*Part- 3*  
*Proposal for Integration*

48. A skill corridor starting from 8th standard onwards and extending up to the graduate level or beyond is proposed as part of an integrated approach to the Technical Education scenario of the State. The entry point shall be an aptitude gateway, an appropriate psychometric analysis tool to determine the student aptitude or interest area and permit them to enter skill area suitable for them. Apart from the regular curricular activities, which will lead them to a professional qualification, the promotional activities of the skill lanes would add value to their academic certificates and also equip them to take up appropriate careers. Entry gates at intermediate points (11th standard, graduate level etc.) may be proposed where student aptitude will be assessed. Skill promotion is expected to happen along with regular curriculum. A student entering the chosen vocational skill lane gets opportunities to get trained in Skill Development Centers in chosen add-on vocational programmes/electives, undergo industry/institutional internships in relevant areas and also get counseling and placement support. The Technical High Schools may be modified to Technical Higher Secondary Schools (10+2 pattern) which could be modeled as a terminal course. On completion, the student shall be competent enough to embark a professional career. Multipoint entry is visualized for the proposed technical or vocational corridor for enhancing skill intensity. Multi-skilling, diversion to specialized areas etc., are also possible in this model. A schematic representation is provided in annexure.
49. Integration of present stream of VHSE with Technical Education may be considered in this regard. This shall provide the aspirants an opportunity for specialized skilling, integrating them smoothly with the present technical education resulting in the overall empowerment of the system.

### *Conclusion*

50. The long term plan is envisioned to elevate the standards of Technical Education on par with national and international standards, so as to groom our students to enable them to face both local and global challenges, to become high quality professionals and to contribute to the development of the nation. The specific thrust is to uplift select institutions in our state to national eminence and international visibility, with quantifiable outcomes in terms of published works, research outputs, patents and community level contributions and to establish centers for interdisciplinary research and development.

ANNEXURE 1  
SCHEMATIC REPRESENTATION OF PROPOSED SKILL CORRIDOR



**PROCEEDINGS OF THE MEMBER SECRETARY  
STATE PLANNING BOARD**

**(Present: Sri. V. S. Senthil IAS)**

Sub: Formulation of Thirteenth Five Year Plan (2017-2022) – Constitution of Working Group on **Technical Education**-Orders issued.

Ref: - Note No. 260/ 2016 /PCD/SPB dated 06/09/2016 from the Chief, PCD

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**No. 298/16/SS (W3)/ SPB**

**Dated:19/09/2016**

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As part of the formulation of Thirteenth Five Year Plan it is decided to constitute 14 Working Groups under Social Services Division. Accordingly Working Group on **Technical Education** is hereby constituted with the following Co-Chairpersons and Members.

**Co-Chairpersons**

1. Sri. B. Srinivas I A S, Pricipal Secretary to Government, Higher Education Department, Government Secretariat, Thiruvananthapuram
2. Sri. R.V.G. Menon, House No. 22, Haritha, Poojappura

**Members**

1. Dr.K. Vijayakumar, Director, Directorate of Technical Education
2. Dr.P.Suresh Kumar, Director IHRD
3. Dr. K. P. Isaac,Vice Chancellor, Abdul Kalam Technological University
4. Prof. P. B. Sunil Kumar, Director, IIT Palakkad
5. Sri. Achuthsankar S. Nair, Director, Department of Computational Biology and Bioinformatics, University of Kerala, Kariavattom, Thiruvananthapuram
6. Dr. Thajudin Ahamed V.I., Assistant Professor, Department of Electronics & Communication Engg. Govt. Engineering College, Wayanad, Mananthavady 670644 - Phone +919447002930
7. Smt. Leena Mary, Professor of Computer Science, RIT, Pampady, Kottayam
8. Sri. M. R. Baiju, Professor of Electronics and Communication, CET, Trivandrum - Tel : 9446495658

**Convener**

Smt. Shila Unnithan, Chief, Social Services Division, State Planning Board

**Co-Convener**

Smt. Saritha S. P., Research Assistant, Social Services Division, State Planning Board

**Terms of Reference**

1. To review the development of the sector with emphasis as to progress, achievements, present status and problems under its jurisdiction during the 11th and 12th Five Year Plan periods.
2. To evaluate achievements with regard to the plan projects launched in the sector, both by the State Government and by the Central Government in the State during these plan periods.

3. To list the different sources of data in the sector and provide a critical evaluation of these data sources, including measures for improvement.
4. To identify and formulate a set of output and outcome indicators (preferably measurable) for Technical Education and base the analysis of the previous plans on these indicators.
5. To make suggestions for the enhancement of quality as well as to setup a permanent mechanism to check the quality of Technical education
6. To ensure the Public-Private Participation in the area of Technical Education so as to increase the employability of the students and to make them up-to date to the present industry demands
7. To suggest, in particular, a set of projects which can be undertaken during the 13th Plan period in the sector.
8. The Co-Chairpersons are authorised to modify terms of reference with approval of State Planning Board and are also authorised to invite, on behalf of the Working Group, experts to advise the Group on its subject matter. These invitees are eligible for TA and DA as appropriate.
9. The working group will submit its draft report by 1st December, 2016 to the State Planning Board.

The non-official members of the Working Group will be entitled to Travelling Allowances and Daily Allowances as applicable to Class I Officers of the Government of Kerala. The Class I Officers of Government of India will be entitled to travelling allowances and Daily Allowances as per rules if reimbursement is not allowed from departments.

***Sd/-***  
**V.S. Senthil IAS**  
**Member Secretary**

To

1. The person concerned
2. The Sub Treasury Officer, Vellayambalam

Copy to:

The Accountant General, Kerala (A&E) with C/L  
All Divisions, State Planning Board  
P.S. to Vice Chairman, State Planning Board  
C.A. to Members  
P.A. to Member Secretary  
C.A. to Sr. Administrative Officer  
Finance Officer, P.P.O, Publication Officer,  
Computer Section, Accounts Sections  
Stock File

*Forwarded/By Order*  
*Sd/-*  
*Chief, Social Services Division*  
*State Planning Board*

**PROCEEDINGS OF THE MEMBER SECRETARY  
STATE PLANNING BOARD  
(Present: Sri. V.S.Senthil.IAS)**

Sub: Formulation of Thirteenth Five Year Plan (2017-22) – Constitution of Working Group on **Technical Education** -Orders issued.

Ref: - 1. Note No: 260/2016/PCD/SPB Dtd: 6/09/2016 of the Chief, PCD, State Planning Board

2. Proceedings No.298/2016/SS(W3) SPB Dated 19/09/2016

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**No. 298/2016/SS (W3)/SPB**

**Dated: 14 /10/2016**

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The following member is also included in the Working Group of Technical Education constituted vide ref 2<sup>nd</sup> cited.

**Member**

Dr. A. Samson, Professor, Mechanical engineering, College of Engineering, Trivandrum. Mobile No: 9447324844.

**Sd/-  
V.S.Senthil.IAS  
Member Secretary**

To

1. The person concerned
2. The Sub Treasury Officer, Vellayambalam

Copy to:

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