CHAPTER 6
FINDINGS, CONCLUSIONS & RECOMMENDATIONS

The Vocational Education, Training & Skill Development sector is rapidly gaining significance in the present scenario. The Central Govt. has realized the direct correlation of skill based education and gainful employment for the youth of our country. The rising unemployment amongst youth educated in conventional streams has further accentuated the importance of Vocational Education and Skill Development. The present scenario around this sector is quite dismal and there is scope for significant reforms. During the course of over 2-3 years of in-depth research, the Researcher has been able to identify problems with the governance, regulation, administration, planning, policy, standards and other aspects related to the Vocational Education, Training and Skill Development sector. The Researcher has given recommendations for each problem area with clear direction for implementation. These are narrated in this chapter.

6.1 Problem Areas in present Vocational Education and Training System

- Vocational Education is presently offered at Grade 11, 12th – however students reaching this Grade aspire for higher education. Since the present system does not allow vertical mobility, skills obtained are lost. Enrollment in 11th & 12th Grade of vocational education is only 3% of students at upper secondary level. About 6900 ITIs & ITCs enroll about 9.5 lakhs students. Students with 12th std vocational/two-year ITI certification are not given lateral entry into equivalent academic year in polytechnic diplomas.

- International experience suggests that what employers mostly want are young workers with strong basic academic skills and not just vocational skills. The present system does not emphasize general academic skills. The relative wages of workers with secondary education are increasing.

- Private and Industry Participation is lacking. There are no incentives for private players to enter the field of vocational education.

- Present regulations are very rigid. In-Service Training is required but not prevalent today. There is no opportunity for continuous skill up-gradation.
There is a lack of experienced and qualified teachers to train students on vocational skills. In foreign countries Bachelors of Vocational Education (BVE) is often a mandatory qualification for teachers. However, in India no specific qualifications are being imparted for Vocational Education teachers.

Vocationalization at all levels has not been successful. Poor quality of training is not in line with industry needs.

There is no definite path for vocational students to move from one level / sector to another level / sector. Mobility is not defined and hence students do not have a clear path in vocational education.

No clear policy or system of vocational education leading to certification / degrees presently available for the unorganized/ informal sector. No Credit System has been formulated for the same.

Social acceptability of skilled manpower is another issue which has affected the growth and popularity of this sector.

Expansion of vocational sector is happening without consideration for present problems.

6.2 REGULATORY FRAMEWORK

The Researcher feels that in order to plan, promote, effectively regulate, develop and popularize the Vocational Education, Training and Skill Development sector, it is essential to create an administrative structure and framework through State legislation. The same is narrated below.

6.2.1 LEGISLATION FOR A VOCATIONAL UNIVERSITY

The Researcher believes that a separate Umbrella or enabling Act for establishment of a Vocational University is required to be enacted at State level. The Act should enable the State to establish one or more Vocational Universities in a PPP Model.

6.3 REGULATORY BODY – STATE LEVEL COMMISSION

The Researcher studied the various implementation strategies that must be designed, developed and implemented to meet the objectives of achieving a single
comprehensive and integrated Vocational Education and Training system from secondary school level to tertiary level in the State of Maharashtra. The Researcher feels that a comprehensive Vocational Education and Training Act must be formulated for the State of Maharashtra.

The scope of Vocational Education and Training Act should be:-
1. To achieve integration of Vocational Education, Training and Skill Development and create a Unified System.
2. To lay down policy and norms for development and coordination of Vocational Education, Training and Skill development (VETSD) at all levels.
3. To evolve a mechanism to regulate and maintain uniform standard of quality, research and development, examinations, certification, affiliations, registration and accreditation across all levels of VETSD.
4. To provide for establishment of a regulatory body, namely, the Maharashtra Vocational Education and Training Commission (M-VEC).
5. To provide for establishment of the Maharashtra Vocational University.
6. To provide for establishment of the Maharashtra Vocational Education and Training Quality Council.

6.3.1 MAHARASHTRA VOCATIONAL EDUCATION & TRAINING COMMISSION (M-VEC)
The Researcher feels that a single regulatory body namely, Maharashtra Vocational Education & Training Commission (M-VEC) hereafter referred to as the “Commission” or “M-VEC”, should be established to plan, promote, regulate, develop, co-ordinate and standardize vocational education, training and skill development at all levels in the in the State of Maharashtra. All vocational education, training and skill development courses/programs presently run by various Boards should come under the purview of the Commission (M-VEC). A joint certification program can be evolved for this purpose. The Commission should also collaborate with the industry and community for understanding labour market needs and trends thus creating a robust Labour Information System (LIS).
6.3.2 MAHARASHTRA VOCATIONAL EDUCATION & TRAINING REGISTRATION AND ACCREDITATION BOARD (M-VETRAB)

The Researcher has recommended that a separate Board be established namely, the Maharashtra Vocational Education & Training Registration and Accreditation Board (M-VETRAB). This board should be responsible for framing rules, regulations, policies, norms, procedures and conditions for Registration, Recognition and Accreditation of VTPs and ensuring that all registered VTPs follow the general policies and guidelines of the Commission.

6.3.3 MAHARASHTRA VOCATIONAL EDUCATION AND TRAINING QUALITY ASSESSMENT COUNCIL (M-VETQC)

The Researcher recommends the creation of a separate quality council, namely, the Maharashtra Vocational Education and Training Quality Assessment Council (M-VETQC) which can be an apex body for quality assessment of institutes, organizations, centers, agencies and establishments the Vocational University offering courses/programs at all levels, in the Vocational Education, Training and Skill Development sector and for coordinating with the Commission to the extent of meeting the Commission’s objectives related to maintenance of Quality Standards by the VTPs and for participating in the Accreditation process of VTPs.

The Researcher feels that the creation of such regulatory bodies including the Commission, Accreditation Board and Quality Council will help in integrating the Vocational Education and Training sector. It will also enable the standardization of courses, curricula and certificates in this sector thus bringing about a qualitative change. In the long run, this model legislative and regulatory framework will help in creating large number of skilled resources in line with industry needs thus establishing a successful Vocational Education and Training system in the State of Maharashtra.
6.4 RECOMMENDATIONS ON SECONDARY SCHOOL EDUCATION (SSC)

The Researcher has made the following recommendations:-

1. Students should be given choice of many more vocational subjects to opt for. It would be desirable to offer non-technical vocational subjects in the high growth sectors also.

2. The vocational subjects introduced at secondary school level are recommended to be credit based and modular in nature.

3. It is recommended that the vocational subjects offered at SSC level should be linked to high growth sectors and also to HSC level vocational groups. This mapping of vocational subjects offered at secondary (9th & 10th) level to the HSC (Vocational) groups to be taken at 11th & 12th level will enable students and their parents to clearly understand the vertical mobility available to them and will help in popularizing this scheme as an alternative to the academic sector.

4. Vocational subject option should be provided as an alternative to third language within the core group so as to take effect in the overall weightage of SSC marks.

5. The proposed scheme for SSC is as follows:-

Proposed SSC scheme:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>Max. Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Language I</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Language II</td>
<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>Elective (Vocational Subject)</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Mathematics</td>
<td>150</td>
</tr>
<tr>
<td>5.</td>
<td>Social Science</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Science</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>650</td>
</tr>
</tbody>
</table>

6. The above proposed scheme will enable students to opt for vocational subject as an Elective / as an alternative to third language and should also carry weightage in the final SSC marksheet thus increasing their motivation to opt for such vocational subjects.
7. NVEQF certificate I (level 1) may be introduced as an elective for 9th std and NVEQF certificate II (level 2) may be introduced as elective for 10th std. This will enable students to enter the NVEQF framework and obtain dual certification at school level.

➢ **Benefits of the new proposed SSC scheme**

1. By introducing vocational subject as an Elective vocational subject carrying weight age in the final SSC mark sheet, the students will be motivated to opt for the vocational stream at secondary level. Further, the linkages to HSC (Vocational) stream will enable them to pursue vocational stream as a viable alternative.
2. It will enable students to obtain additional certificates of pre-vocational training in line with NVEQF.
3. It will lead to introduction of vocational education at school level similar to education models in other foreign countries like China.
4. Introduction of vocational electives at school level will enable promotion of vocational education and expose the parents to alternate streams of education.
5. It will provide students with an opportunity to understand and make the right choices in selecting vocational courses at senior / higher secondary or tertiary levels during their academic tenure.
6. It will provide students with an opportunity to pursue new streams in Vocational Education at higher education level and get exposed to the world of work.
7. Vocational education at school level will provide students some basic pre-vocational skills which can be further developed at higher secondary level.
8. It will help expand the vocational education base at school level and will be in line with the national policy of skill development of Central Government and Vocationalization of secondary education policy of the Government of India.
9. It will enable integration of academic and vocational education and training systems.
6.5 RECOMMENDATIONS FOR HIGHER SECONDARY EDUCATION (HSC) – MCVC SCHEME

1. Research has indicated that Industry require people with not only vocational training but also those having basic academic skills and life coping skills like problem solving, numeracy, analytical skills, computer literacy, team work, basic communication skills, leadership etc. It is thus recommended that general academic skill based courses should be included as a compulsory component of HSC Vocational syllabus. These general academic skill based courses should have different teaching-learning pedagogy based on practical, role play, interactive method and separate continuous assessment system.

2. In order to create opportunities of vertical mobility, the syllabus should comprise of applied subjects such as applied mathematics, applies sciences etc. These subjects may be introduced as electives as core component of the syllabus. The ‘Applied’ subjects should ensure coverage of core topics required for vertical mobility into respective undergraduate programs.

3. Conventional Universities and colleges should give equivalence to HSC Vocational students in order to facilitate lateral/vertical entry into undergraduate / bachelors programs in respective academic areas. Presently in Maharashtra this lateral/vertical mobility is only possible for Arts and Commerce stream however; other streams such as Nursing, Medical, Para Medical, Engineering, Agriculture etc do not allow entry to HSC Vocational students.

4. HSC Vocational students should be allowed in Maharashtra, to appear for Engineering and Medical entrance exams as well as other relevant entrance exams for admission into conventional bachelors degree programs.

5. HSC Vocational scheme should be expanded to cover high growth sector related courses such as Construction, Service, Retail, Banking & Insurance, Hospitality etc.

6. Courses of the HSC (Voc) curriculum should be modular and credit point based. A facility for credit banking and transfer should be created and available for students to make the curricula flexible and open.

7. In order to facilitate both vertical and lateral mobility into conventional academic sector, the following changes in HSC Vocational scheme are recommended.
These changes will allow students to choose suitable groups as per their desire for mobility to other education sectors.

A. RECOMMENDATIONS FOR 11th Std (VOCATIONAL)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>Teaching Period/Week</th>
<th>Examination</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
<td>Theory</td>
</tr>
<tr>
<td>1.</td>
<td>English</td>
<td>5</td>
<td>--</td>
<td>80</td>
</tr>
<tr>
<td>2.</td>
<td>Elective I</td>
<td>5</td>
<td>--</td>
<td>80</td>
</tr>
<tr>
<td>3.</td>
<td>Elective II</td>
<td>5</td>
<td>--</td>
<td>80</td>
</tr>
<tr>
<td>4.</td>
<td>Vocational Subject I</td>
<td>4</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>5.</td>
<td>Vocational Subject II</td>
<td>4</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Vocational Subject III</td>
<td>4</td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>

Student can take any one subject in Elective I & II:-

<table>
<thead>
<tr>
<th>Elective I</th>
<th>Elective II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language viz Marathi, Hindi etc.</td>
<td>General foundation course</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Applied Science (Phy &amp; Chem)</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>Computer Application</td>
</tr>
<tr>
<td>Physical Biology (Botany &amp; Zoology)</td>
<td>Business Mathematics</td>
</tr>
<tr>
<td>Business Economics</td>
<td></td>
</tr>
</tbody>
</table>
B. RECOMMENDATIONS FOR 12th Std (VOCATIONAL)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject</th>
<th>Teaching Period/Week</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>1.</td>
<td>English</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>Elective I</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>Elective II</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>Life Coping Skills / Generic Skills</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>Vocational Subject II</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>6.</td>
<td>Vocational Subject III</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

8. The students desirous of obtaining equivalence with NVEQF levels 3 & 4 may be given an exemption for the common modules covered under the HSC (Voc) syllabus.

9. It is also recommended that the HSC Vocational courses should be modified to be more ‘competency-based’ and in line with the NVEQF requirements in the future.

10. It is recommended that the focus should be on ‘work-centered’ education such as on-job training, industry visits, production-oriented training, apprenticeship, and industry liasoning etc thus creating industry-ready youth.

11. It is recommended that each college/school providing HSC Vocational should have tie-up with the local industry, NGOs and other community stakeholders through the Industry Management Committee thus facilitating inputs in project work, teacher training, guest lectures, student grooming, summer placements, in-service training of industry employees etc.

12. It is recommended that each college/school providing HSC Vocational should have a Placement Cell, Entrepreneurship Development Cell and Finishing School/Department.

13. Liasoning with Sector Skill Councils of National Skill Development Corporation (NSDC), to engage industry and community is recommended to be carried out. PPP models with incentives for industry participation may be encouraged.
14. The HSC Vocational pass out should be given parity (declared as alternate qualification) to ITI and Polytechnic pass out students for the purposes of recruitment in Govt. and Non-Govt. organizations.

15. The recruitment rules of the Public Service/ Govt. / Semi-Govt. Departments should be suitably modified to recognize HSC Vocational qualification for employment purposes.

16. Teacher training is required to orient the vocational teachers to the new teaching learning methodology, scheme and curricula.

17. It is recommended that in the future the activities related to assessments, examinations and declaration of results of HSC (Voc) students or other students pursuing courses / diplomas at 10+2 level may be conducted by MSBTE.

Since the implementation of the MCVC scheme has been left to the State, it would be possible to implement above recommendations in Maharashtra, in order to ensure success of this scheme.

➢ Benefits of the new proposed HSC (Vocational) scheme

1. The above recommendations will provide an impetus to the enrollment of students in the vocational education sector.

2. The changes and enhancements to the HSC Vocational syllabus will improve the employment opportunities to students. The inclusion of general academic skills and industry liasoning will result in better acceptability of students within the local industry.

3. The change in recruitment rules will provide guaranteed employment options to vocational students.

4. Lateral and vertical mobility into and from academic sector to vocational sector will be achieved through introduction of applied subjects as electives.

5. The options of vertical and lateral mobility will also popularize and expand the vocational sector amongst students and thus facilitate higher enrollment into this sector.

6. The linkage to NVEQF will also ensure alignment with Central Govt. plans. Credit based and modular curricula will be of great benefit to students especially the provision for credit banking and transfer.

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7. Popularization of vocational education will lead to increase in GER at the 10+ level.

8. Higher enrollment into the vocational sector will reduce the burden on conventional colleges and universities and will open new opportunities of learning for students.

9. The affiliation to the Vocational University will create opportunities of higher education in the form of diplomas for students while continuing to study in the same school or Junior College.

6.6 RECOMMENDATIONS FOR BIFOCAL SCHEME

1. The curriculum revision should take place periodically in consultation with industries to keep it in line with the market needs.

2. It is recommended that the focus should be on ‘work-centered’ education and on-job training, industry visits and production-oriented training must be made a compulsory component of the curriculum

3. The marking scheme of bifocal stream must give 50% weightage to theory and 50% weightage to practical.

4. Options of various vocational subjects as electives must be given to students without any restrictions. A multi-disciplinary approach is recommended to be adopted.

5. Separate infrastructure with state of art equipment must be established to conduct hands on training for the bifocal students.

6. The theory workload of the teaching staff should be increased by atleast one hour per week. The teaching staff must also take responsibility for project work and industry visits of the students.

7. The scheme must be continued with 200 marks allotted for vocational subjects.
6.7 RECOMMENDATIONS FOR INDUSTRIAL TRAINING INSTITUTES

1. It is recommended that students undergoing 2 year ITI courses after passing 10th std may be given an option of obtaining HSC pass certificate by meeting the following compliances:-

(a) The students can have to appear for following subjects externally:-
   - English (core subject)
   - Applied Mathematics/Information Technology (Elective I)
   - Life Coping and General Academic Skills (Vocational Subject I)

(b) Exemption can be given for Elective II against Trade theory II covered under the ITI scheme.

(c) Exemption for Vocational subjects II and III can be given against Workshop practice.

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>HSC(Vocational)</th>
<th>Mapping for ITI two -year Engg Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>English</td>
<td>Appear Externally</td>
</tr>
<tr>
<td>2.</td>
<td>Elective I</td>
<td>Applied Maths/Information Technology ( Appear Externally)</td>
</tr>
<tr>
<td>3.</td>
<td>Elective II</td>
<td>Trade Theory (exempted)</td>
</tr>
<tr>
<td>4.</td>
<td>Life Coping Skills / General Academic Skills</td>
<td>Appear Externally</td>
</tr>
<tr>
<td>5.</td>
<td>Vocational Subject II</td>
<td>Workshop Practical (exempted)</td>
</tr>
<tr>
<td></td>
<td>Vocational Subject III</td>
<td>Workshop Practical (exempted)</td>
</tr>
</tbody>
</table>

Note:

1. The proposed scheme for ITI students to get HSC (Voc) certificate is applicable only for Engineering trade -two year courses and three year courses only. Non Engineering trades – Certificate courses of ITI in this group are only upto one year duration and as such they should not be considered for HSC (Vocational) mapping.

2. Systematic skill mapping and labour market analysis is required to be carried out and curriculum revised in line with NVEQF.

3. The existing qualification of ITI faculty needs to be of higher standard with compulsory component of industrial experience. Emphasis should be given to
teachers training and skill upgradation. Vocational University can undertake the responsibility of faculty training and development

4. The curriculum revision should be undertaken on annual basis in line with the industry needs. The curriculum should be modular, competency based with multi entry exit option.

5. Research has indicated that Industry require people with not only vocational training but also those having basic academic skills and life coping skills like problem solving, numeracy, analytical skills, computer literacy, team work, basic communication skills, leadership etc. It is thus recommended that general academic skill based courses should be included as a compulsory component of ITI syllabus. These general academic skill based courses should have different teaching-learning pedagogy based on practical, role play, interactive method and separate continuous assessment system.

6. The equipment and machinery used to impart training should be advanced, modern and similar to machinery used in industries for production purposes.

7. Strong linkages are required to be developed with local industries through in-service training of employees, industrial visits for students, apprenticeship training, guest lectures, skill exchange and placements, production oriented training, industrial consultancy projects etc.

8. Private organizations should be encouraged with relaxed norms to establish ITCs.

9. Formalization of Recognition of Prior Learning scheme must be done by ITIs.

6.8 RECOMMENDATIONS FOR MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION (MSBTE)

1. Students pursuing MSBTE programs of 2/3 years duration should be given mobility options to enter the academic sector – that is into undergraduate degree programs in their respective disciplines in conventional Universities/Institutions.

2. MSBTE courses in non engineering sectors should be increased to meet the requirements of high growth service sector.

3. Students completing Polytechnic may be allowed to appear for HSC exam externally if they desire to enter academic sector.
6.9 RECOMMENDATIONS FOR COMMUNITY COLLEGES

1. The Community Colleges abroad especially in USA have become extremely successful in creating employable youth required by local industry, thus contributing to the local community development. This scheme in its spirit is highly effective and beneficial provided the implementation meets the objectives. It is therefore recommended that Community Colleges be setup under the aegis of the State Govt. with linkages to the proposed State level Regulatory Body (referred to as Commission) and the Vocational University, especially for award of certificates /degrees, quality assessment, accreditation and standardization of curricula.

2. The Community Colleges should be affiliated to the Vocational University for the purpose of offering diplomas and associate degrees.

3. State Govt. should ensure that local universities and colleges give recognition to diplomas and associate degrees awarded by the Community Colleges for the purposes of admission into their system.

4. Community Colleges should ensure that the vocational teaching learning pedagogy is followed by recruiting trained faculty and must also ensure quality of education provided to students. The college must emphasize hands-on and on-job training, field visits, project work etc for students pursuing vocational courses.

5. The Community Colleges must establish linkages with the local industry, NGOs and other community stakeholders for the purposes of placement, internships, project work, guest lectures, filed visits etc.

6. The Community Colleges must emphasize on localization and contextualization of content and curricula so as to benefit the local community and industry.

6.9.1 Benefits of proposed implementation of the Community Colleges

1. By ensuring that the certificate/diplomas/degrees offered by the Community Colleges are regulated, the students will be benefited by getting a standardized curricula and quality. Students and industry will also benefit through creation of employable youth who have skills that have been measured and assessed.
2. Community Colleges will benefit by being affiliated to the Vocational University for providing vertical mobility options to all their students. This will also increase the popularity of the courses and thus the Community Colleges.

3. By allowing Community Colleges to be opened, the State Govt. can ensure localization of vocational education & training while at the same time the local community and industry will benefit and grow.

4. Localization and contextualization of content and curricula will enable the Community Colleges to contribute to the local community & socio-economic development as well as industrial growth.

6.10 RECOMMENDATIONS FOR HIGHER/ TERTIARY EDUCATION

6.10.1 VOCATIONAL UNIVERSITY

The primary objective of the Vocational University should be to provide vertical mobility to students in vocational stream by offering Bachelors, Masters and Doctoral programs in vocational studies and offer various specializations as required by local community & industry.

The Vocational University can be established:-

(a) To provide a teaching learning pedagogy focused on hands-on training and skill development in line with market needs.

(b) To conduct research in labour market requirements in order to understand emerging trends and offer suitable curricula, courses & programs.

(c) To offer facility for recognition of prior learning and credit banking/transfer system

(d) To provide students an opportunity of life long and continuous training through University courses.

(e) To employ flexible modular approach to training thereby enabling multi entry and exit option.

(f) To conduct pedagogical and skill enhancement training and development programs for faculty and trainers who are involved in imparting vocational education & training.

(g) To encourage industrial participation through establishment of innovation labs, in-service training centers and active participation in all aspects of governance, curricula design, placement, internships etc.
(h) To offer vocational degrees in order to improve social acceptability of skilled manpower and students.

A. Mode of Education & Teaching – Learning Pedagogy

1. Vocational University should emphasize on a different teaching – learning pedagogy with a special focus on skill based and hands-on learning and training. Teaching should take place in the form of lectures supported by practicals, seminars, filed visits, etc. At the same time the University should ensure that a strong foundation of required theoretical inputs is given to students.

2. Vocational University should offer vocational programs through online, distance and life-long learning mode in addition to face-to-face mode. This will be especially helpful for continuous skill up-gradation.

3. Vocational University Curriculum should emphasize life coping skills, general educational skills such as English competency, analytical skills, problem solving, entrepreneurial skills, team work, leadership, management, soft skills etc. A ‘Finishing School’ concept can be implemented as part of each program of study. Multi skilling shall be emphasized.

4. Vocational University should offer flexible modular courses with credit banking and transfer facility. Flexible timings including evening classes shall also be conducted.

5. There should be a compulsory component in each program in the form of 1-2 semesters of practical training integrated within the study courses. During these ‘practical semesters’ the students would work in industry / organizations / administrations etc to obtain on-job training and become market-ready.

6. Research at the University should be in the form of industry driven projects done by faculty and students in collaboration with industry partners.

7. The University should also encourage ‘Production oriented labs’ setup in collaboration with industry partners. Practical and training in such labs will be integrated as part of the program curriculum.

B. Model

The Vocational University may be established in a PPP (Public-Private-Partnership) Model. Private Participation is critical to the success of a Vocational University. A Government –Academia –Industry partnership model may be adopted. Industry can
collaborate for setting up of labs, equipment, trainers, internships, placements for students, training of students & faculty, participation in governance, quality checks, curricula design etc. Collaboration with government bodies and banks can be established for fund support to students.

C. Salient Features
The Vocational University should focus on the following aspects in addition to the above:-
(a) Faculty Training & Academic Development – University can conduct various training programs for faculty including assessors training.
(b) Providing Life Long Learning Opportunities for working professionals
(c) Applied Research for taking up projects in collaboration with local industry and community
(d) Industry Collaboration for purposes of student and faculty training, research, community initiatives, placement, apprenticeship etc. production oriented labs should be setup in collaboration with local industry. Localization and contextualization should be emphasized.
(e) Entrepreneurship Development Cell can be created to encourage innovation amongst students.
(f) Recognition for Prior Learning cell can be established to recognize and map previously obtained skills of students coming from the working sector who wish to pursue courses at the University.
(g) Credit System with modular courses and facility to bank and transfer credits.

D. Specific Recommendations about a Credit System
1. The vocational courses offered at SSC, HSC, certificate, diploma and degree level are recommended to be credit based and modular in nature thereby creating flexible learning pathways. The curricula and assessments systems need to redesign in order to introduce credit based courses.
2. The students may be allowed to accumulate and transfer their credits across various VTPs as well as the Vocational University as per the policies laid down in this regard. The credits given by one institution /VTPs may be recognized for credit exemption by another institution/VTP. For example – If a student has done a course in Engineering Mechanics worth 4 credit points in a polytechnic institute
his 4 credits may be recognized by all engineering colleges for credit transfer thereby enabling student to accumulate and transfer his credits for obtaining a degree.

3. For the informal sector, credit based modular courses of varying duration may be provided by Vocational University or any other Vocational Training Providers (VTPs). These short duration courses can enable the workforce in the informal sector who are unable to pursue full time courses, to accumulate and transfer their credits for obtaining a degree/diploma/certificate over a period of time. This can also encourage life-long learning and continuous skill up gradation.

4. The Department of Recognition of Prior Learning (RPL) of a Vocational University can define the Recognition of Prior Learning policy. A ‘certificate of mapping’ can be awarded based on prior achievements or pre-acquired skills obtained by the applicant to enable the applicant to seek exemption or transfer courses across various VTPs with the objective of continuing further vocational education, training or skill development. The Department of RPL can facilitate measurement of credits earned by virtue of completion of learning or training. For example:- A beautician with 10 years of experience can obtain a certificate of mapping by getting her skills assessed and get exemption for some of the foundation courses associated with a beautician program offered by any VTP or a Vocational University.

E. Benefits of a credit system

1. **Standardization:** Credit System can enable standardization of student effort across various levels of learning. The credit points designated to a particular course will indicate the student effort required for the completion of that said course.

2. **Mobility:** Credit system will facilitate vertical and lateral mobility through credit transfer and accumulation. Mobility can be achieved between different educational sectors and contexts of learning i.e. formal, non formal and informal learning. Credit rating will make it easier to compare qualifications and facilitate the recognition of achievements from one VTP to another.

3. **Encourages Life-long learning:** Credit accumulation and transfer will enable life-long learning. A number of adult students who cannot pursue full time degree programs can undertake stand alone educational programs and can accumulate and transfer those credits to obtain a formal certification/degree over a period of time.
Credit system thus provides a clear learning pathway to part time students and encourages them to pursue life-long learning.

4. **Quality Assurance:** Credit system will ensure that quality standards are maintained and adhered by all institutions by clearly defining the learning outcomes and the student workload for each course in the curriculum.

5. **Framing of National Vocational Education Qualification Framework:** The National Vocational Education Qualifications Framework (NVEQF) sets out the levels against which a qualification can be recognized. All accredited qualifications are awarded an NVEQF level. If a qualification shares the same level as another qualification, they are broadly similar in terms of the workload a student is required to complete. However, qualifications at the same level can still be very different in terms of content and duration. Therefore, to formulate the National Vocational Education Qualification framework it is important to frame the credit system in which each level of qualification within the NVEQF is assigned its credit worth.

6. **Non formal and informal sector:** Credit system will enable institutions of higher education to recognize and grant credits for learning outcomes acquired outside the formal learning context through work experience, provided that these learning outcomes satisfy the requirements of their qualifications or components. The Recognition of Prior Learning scheme will allow the informal sector to come into the mainstream by assessing and mapping their prior learning or pre-acquired skills and giving exemptions in credits for courses thus enabling them to pursue further education and training. This scheme will provide opportunities of learning for the blue collared unorganized sector by creating learning pathways for acquiring certifications, degrees and advanced skills.

7. **Flexible learning pathways:** The credit system will provide flexible learning pathways to students by providing them multi-entry exit option, the ability to accumulate and transfer credits and lateral and vertical mobility across VTPs.

F. **Academic Degrees at the Vocational University**

1. Vocational University can offer all kinds of Bachelor, Masters, Doctoral degrees and Diploma programs in vocational higher education sector. The University can also offer a separate Bachelors degree for Vocational Education teachers.

2. University can offer diverse vocational specializations.
3. Separate degree called Bachelors in Vocational Education or B.Ed with specialization in Vocational Education can be offered for vocational education teachers & trainers.

4. Vocational degrees will offer better social acceptability for skilled manpower by creating flexible learning pathways and bringing both organized and unorganized sector into the main stream of education. Vocational degrees will also make this sector popular as students and parents will not hesitate to pursue a vocational course if there is clear vertical mobility leading to a degree.

5. The researcher recommends that UGC should create separate vocational degrees at undergraduate and post graduate levels under List 22. E.g. a Bachelor in Vocational Studies Degree can be created for a 3-4 year under graduate program. Much specialization can be offered under this degree. The curriculum should be market based with 1-2 semesters of practical component (hands-on Training). The faculty teaching such programs should also be having industrial experience and understanding of the vocational pedagogy.

G. Multi Entry - Exit Option

The Vocational University should offer a clear mobility pathway to vocational students with multi entry exit option at each level. The proposed mobility path from higher secondary to tertiary education is illustrated below:-

![Diagram of Vocational Mobility Pathway]
H. Industry participation

1. Industry participation is critical to a Vocational University.
2. Industry representatives should also be involved in governance and curriculum design. The learning outcome for each academic programs should be in line with the Industry requirement. The University should collaborate with the industry to understand labour market trends and needs on a continuous basis.
3. **Adjunct Faculty Service:** The industry should have the corporate responsibility to provide industrial trainers for training of the students of the University. Incentives may be given to the employees for undertaking this responsibility.
4. **Production Oriented Laboratories:** Production Oriented Research and Innovation Labs should be setup in collaboration with Industry to promote regional and economic growth. The industries can provide the latest state of art machinery and equipment for carrying out hands on training of the students. These laboratories should also pioneer new products and carry out research specific to the requirement of the Industry.
5. **In-Service Training:** In-service training should be organized and industry encouraged to send employees for regular skill development and up-gradation.
6. **On the job training:** On the job training in Industries should form a compulsory component of the curricula. The industry should undertake on the job training at least two times in a week.
7. **Apprenticeship Model:** Apprenticeship/Stipend/Scholarship/ Fellowship Models should be devised in consultation with the Industry partners.

A Vocational University will thus not only benefit the local industry, society, community and the State of Maharashtra but also our country as a whole. The Vocational University will improve the social acceptability of vocational students and skilled manpower. The Vocational University will popularize the Vocational Education and Training (VET) sector as an alternate career option by providing a clear vertical mobility pathway to students.
6.11 RECOMMENDATIONS FOR THE INDUSTRY & COMMUNITY

Industry plays an important role in the Vocational Education, Training and Skill Development sector. In the past, the Industry has not played an active role in the development of this sector. High cost of training, inability to afford downtime and increasing overheads and costs associated with poor efficiency are all factors which have driven the industry to demand skilled workforce. The Researcher makes the following recommendations for the Industry and community with regard to the VET sector:

6.11.1 Industry Participation in NVEQF:

The National Policy on Skill Development-2009 of Government of India identifies National Vocational Education Qualifications Framework (NVEQF) as the main instrument for linking various education and training pathways. The Ministry of Human Resource Development (MHRD) is in the process of establishing the NVEQF. The NVEQF proposes to provide a common reference framework for linking various vocational qualifications and setting common principles and guidelines for a nationally recognized qualification system and standards. The Government has set up an inter-ministerial group which would also include representatives of State Governments, including Maharashtra, to develop guidelines for such a National Framework. The NVEQF will create flexible learning pathways, which will permit individuals to accumulate their knowledge and skills and convert them through testing and certification into higher diplomas and degrees. NVEQF will support lifelong learning, continuous upgradation of skills and knowledge. The basis for NVEQF will be inputs from the Industry in the form of the NOS. Thus, industry has an important role to play in the future of the VET sector. For purposes of implementation the National Skill Development Corporation of the Central Government has formed Sector Skill Councils (SSCs) in all States. The SSCs are responsible for coordinating with various industry sectors to gather skill requirements, competency needs and occupation standards. They will also provide input to finalize the NOS for each occupation within each industry sector.

The critical factors for the success of NVEQF will however remain the input from industry, acceptance of the industry for vocationally qualified manpower,
participation and engagement of industry for implementation of NVEQF, curricula design for NVEQF based courses, designing competency based assessments and above all teacher training to deliver a competency based NVEQF course.

The Researcher feels that the challenge would be to develop a mindset for designing and administering competency based courses to students in the new model of NVEQF. The Researcher, after receiving feedback from the faculty, concluded that substantial training would be required for faculty in the VET sector to design and deliver competency based courses in line with NVEQF. The State and Central Government will have to play an active role in arranging such training programs prior to rolling out the NVEQF model.

The Researcher has recommended that the industry participation should be encouraged at all levels such as:

1. Curricula design and specifying needs for various job roles
2. Hands-on and on-job training for students
3. In-service training
4. Contribution by way of equipment, production oriented labs, research labs etc.
5. Internships, apprenticeship and placements for students
6. Participation in teacher training and skill up gradation
7. Continuous participation and contribution in the implementation of skill based training and vocation education courses to students.
8. Creation of Industry Management Committees for all VTPs including Vocational Junior Colleges and the Vocational University.
9. Participation in the PPP model for establishment of a Vocational University.
10. Active participation in all aspects of the VTPs and the Vocational University including governance, curricula, labs, teacher selection and outsourcing of research projects to the University.
11. Participation in defining skills and competencies required for each occupation within their respective industry/sector. This input will be useful for establishing the National Occupation Standards (NOS) and National Vocational Education Qualification Framework (NVEQF) levels.
12. Participation in labour market research and needs analysis.
13. Emphasizing the need for formal vocational qualification / certification as part of the recruitment rules or at the time of appraisal.

6.11.2 COMMUNITY PARTICIPATION

Initiatives for the VET sector:
The Community plays an important and integral role in the overall development and growth of the vocational education, training and skill development. In fact the success of the initiatives undertaken by any local government body related to the VET sector will largely depend on the participation of the community. Without localization and contextualization of the vocational education and training courses/programs the growth of this sector will be limited. Having regard to this important role played by the Community, the Researcher undertook interactions with important stakeholders of the local Community, students and faculty representing ITIs, ITCs and other Vocational Institutions/Colleges. The Researcher undertook a survey of approximately 2300 students and about 350 faculties from varied regions of Maharashtra – rural, semi-urban and urban regions. The results of the survey were extremely motivating. Both faculty and students wish to increase participation with the local Community and feel that this is an important criteria for overall success of the VET sector. The informal sector form a large part of the workforce and the Community can play an important role in training and skilling of this large section of the Community. The creation of local opportunities for population will further inhibit migration to cities. Thus, the active involvement of local Community in the implementation of vocational education & training will eventually lead to socio-economic growth of the region.

The Researcher therefore recommends that the local Community stakeholders such as NGOs, local government bodies, social workers and other locally operating agencies or establishments should be actively involved in defining the Community needs and designing vocational courses/programs. The Community should also be involved in other aspects such as:
1. Motivating local population for undergoing skill training
2. Arranging special skilling or training programs for informal workforce through local trainers
3. Arranging local trainers such as craftsmen, artisans and other highly skilled persons who can train students and workforce in the local community
4. Creating Community Skill Development centers, where local population can be skilled/trained and common infrastructure/equipment can be contributed by the local community and industry
5. Arranging workshops, seminars and counseling sessions from local experts for benefit of students and workers
6. Providing input about labour market needs local needs of skilled manpower so as to contribute to the Labour Information System.

6.12 RECOMMENDATIONS FOR THE UNORGANISED SECTOR

1. Recognition of Prior learning (RPL) is recommended to be given to the persons in the unorganized sector for the skills obtained by them through life experience and informal training. Department for Recognition of Prior Learning are required to be established in formal vocational training institutions to give credit to the students coming from the unorganized sector. Bridge courses can be designed to enable the students with informal training to enter the formal vocational training sector. The RPL will offer courses in line with NVEQF.
2. Specially designed modular courses must be provided through non-government vocational providers and NGOs to meet the diverse requirement of the informal sector.
3. In service training for the workers and apprentices in micro enterprises is recommended to be provided in public private partnership.
4. Non Formal education offering SSC or its equivalent certification in vocational stream is recommended to be created for the unorganized sector. Such students can be given bridge courses enabling them to acquire SSC or its equivalent 10th grade certificate. The Maharashtra Institute of Open Education (MIOE) has proposed to roll out such a scheme through SIOS. The Researcher recommends that MIOE considers existing problems of the unorganized sector and tailor its proposed scheme in line with the above recommendation.
5. The students appearing for SSC/10th grade through NIOS must be allowed admission to HSC (Vocational) by relaxing the academic requirements and norms.
6. At Vocational University level, Department of Recognition of Prior Learning and Department of Continuing Education will address the vocational training needs of the unorganized sector by offering specially designed modular courses.

7. Continuing vocational training programs must be offered through VTPs and the Vocational University, both in the public and private sector.

8. Formal educational requirements may be relaxed to give access to vocational education and training for the unorganized sector.

9. Industry needs to emphasize on formal vocational training for its entire workforce including those from the unorganized sector. Thus, it is important that the industry emphasizes a vocational training certification for the unorganized sector at the time of retaining them or within a stipulated period of time after joining the industry.

6.12.1 RECOMMENDATIONS FOR MODULAR EMPLOYABLE SCHEME (MES)

1. It is recommended that for each MES course the assessment criteria should be well defined. Standardization of assessment methodology must be done.

2. Synchronization of testing, certification and reimbursement of fees must be properly done.

3. The VTPs should take the responsibility of linking jobs to MES scheme.

4. The resource requirement such as infrastructure, teaching staff, labs etc must be pre-defined for each of the MES courses to enable standardization of quality of training being imparted by various VTPs.

5. A district wise survey is recommended to be undertaken to map the sector wise requirement of manpower in the unorganized sector. MES courses can be then designed to meet the specific market requirement.

6. After NCVT training and certification, six month industrial training must be made mandatory.
6.13 SUMMARY

In conclusion, the following important recommendations the details of which have been elaborated upon in the earlier pages, are being summarized below:

1. There should be a unified system of vocational education, training and skill development in the State offering standardized courses/programs at all levels for the benefit of students, industry and community as a whole.

2. There should be a single regulatory body such as, the proposed Maharashtra Vocational Education and Training Commission (M-VEC) to plan, promote, regulate, develop, co-ordinate and standardize vocational education, training and skill development at all levels in the State of Maharashtra.

3. There should be an accreditation board such as, the proposed Maharashtra Vocational Education and Training Registration and Accreditation Board (M-VETRAB) for registration, recognition and accreditation of all vocational training providers in the State.

4. There should be an independent quality council for the vocational sector such as, the proposed Maharashtra Vocational Education and Training Quality Council (M-VETQC) for quality assurance of vocational training providers in the State.

5. The State should encourage establishment of one or more Vocational Universities in the State to popularize this sector, create opportunities of higher vocational education and for providing vertical mobility to students from this stream.

6. Researcher has recommended introduction of pre-vocational subjects at secondary level with some minor modifications to the existing SSC scheme.

7. Researcher has recommended introduction of Electives and Life Coping Skills (Generic skills) in the HSC (Voc) curricula so as to enable vertical mobility for these students in conventional undergraduate programs and improve employability of students.

8. Researcher has recommended some bridge courses which can be done by ITI students as external subjects to obtain HSC (Voc) certification.

9. Researcher has recommended introduction of credit system including credit banking and transfers, modular course structure and introduction of life coping (generic) skills in all vocational courses/programs to enhance employability and create flexible learning pathways.
10. Researcher has recommended increased industry and community participation and engagement in all aspects of the VET system and especially with VTPs and the Vocational University.

11. Researcher has recommended that a Recognition of Prior Learning scheme be introduced for the informal sector to come into the mainstream. The creation of a single regulatory body, the Commission will enable the creation of an integrated system of vocation education, training and skill development in the State. The important suggestion of establishing India’s first Vocational University in the State will create a landmark in the history of Maharashtra and India.

The Researcher hopes that this thesis and the recommendations therein will create an educated, trained and skilled human resource which will contribute towards productivity of the industry and growth of the society, community, State and our country as a whole.