Training of Teachers: Institutionalising Training and Development of Academic Faculty of TVET Institutions for Realising Excellence

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1 Introduction

> *"In the last century we were very proud of IITs (Indian Institutes of Technology). It is a very good thing no doubt but in this century we need to think about ITIs (Industrial Training Institutes) and give it the same importance,"*

said Shri Narendar Modi, current Prime Minister of India at the National Conference on Skill Development on the morning of Wednesday 25th September 2013.

In India only 40% of the 55,000 instructors at Technical and Vocational Education and Training (TVET) have undergone a full instructor-training course. There is huge shortage of quality instructors in the country. The quality of training depends upon the quality of trainer. Therefore, there is an urgent need to look into the training of the trainers of ITI (data compiled from Planning Commission Reports 2011).

The role of TVET in preparation of manpower for the national development is well acknowledged in India today. Never the less, the potential of this aspect of education has not been fully exploited due to a wide variety of constraints. One of them being lack of qualified, trained and motivated trainers essential for determining the skills of future workers. The issues and challenges of TVET teachers are quite different from general teachers and thus require a distinct response in terms of skills and competencies that should be regularly updated alongside technological. Concentrating on capacity building of the trainers of TVET will maximize the nation's investment in vocational education.

2 Rationale for Staff-Training for Excellence

The Indian government has been dedicated to reform the education system and to place India into a world class education hub. A knowledgeable and skilled workforce is seen as the most important human capital required for the development of India. The work force needs to be continuously equipped with knowledge and

skills to increase India's competitiveness in the global market. This requirement is leading to a demand on the skills delivery system, which is particularly the role and responsibility of TVET teachers or trainers (see chapter 13).

The most important 'agent of change' in 'Knowledge Society' is the teacher. The Second International Congress on TVET (1999) organised by UNESCO points out that from economic growth to human development the bridge has to be built through the teachers who are well trained. It is essential that Technical and Vocational Education (TVE) teachers are not only qualified in an academic sense, but have a good knowledge of real world systems and processes within their field of teaching. It is critical that the TVET teachers possess knowledge, skills and attitude relevant to the rapidly changing labour market. Ideally, this should be attained prior to entering TVE teaching duties, and kept up to date by regular contact with industry or commerce, or otherwise addressed through in-service programs. In this context, Bird (1997) defined a fully qualified technical/ vocational teacher as one who is certified in his/ her area of expertise, and has appropriate level of pedagogical skill. Without qualified and well-experienced TVET teachers and trainers to plan for and execute TVET programs not much can be realised at the grassroots (see chapter 3).

An entirely new package of educational content, new set of skills and new methodologies for delivery are emerging as among the greatest shifts in paradigm in teacher educations. An important step forward in addressing this problem must begin with teacher preparation and professional development. Professional development contains a huge amount of knowledge and experiences. These experiences can be divided into formal experiences (such as attending workshops, professional meetings, monitoring, etc.) and informal experiences such as (reading professional publications, watching television documentaries related to academic discipline, etc.) (Gancer 2000). TVET teachers should possess the appropriate personal, ethical, professional, teaching qualities and play an influential part in helping to shape students' attitudes and aspirations. Good preparation will enable TVET trainers to operate in, and adapt to, an ever-changing scientific, technological, and social environment. Duke and Stiggins (1990) name five areas in teacher professional development: improvement of lessons, vocational development, school organisation, personal development and career development.

TVET teachers always need to increase their capacity; therefore, besides knowledge of the subject matter, subject-related didactics, educational sciences, and psychology, a teacher also needs diagnosis, evaluation, co-operation and quality development.

Dimensions	Undesirable	Desirable
Pedagogical Base	Instructive Model	Eclectic Model based on Constructivism
Learning Focus	Content	Learning to Learn
Learning Strategies	Solely Interactive	Collaborative & Interactive
Learning Goal	External Controlled	Autonomous
Curricula	Traditional	Competency Based
Teacher Role	Didactic	Facilitative
Delivery Modes	Fixed	Open
Learning Approaches	Surface	Deep
Learning Structures	Rigid	Flexible/Modular
Instructional Models	Instructor Centred	Learning Team Centred
Learning Methods	Passive	Active

Table 1: Shifts in the Pedagogical Dimensions of Teacher Education. Source: Majumdar (2011)

Professional development has a significant positive impact on teacher's beliefs and change in school practices, students learning and on the implementation of educational reforms (Cobb 2000; Frankes et al. 1998; Nelson 1999: 6). This statement also supported by Wood and Bennett (2000) and by Kallestad and Olweus (1998) in a study involving Norwegian teachers emphasised that the professional preparation and development have a large impact on defining teachers' goals for their students and these goals in turn affect the teachers' behaviour in the classrooms and schools. But to realise that, teachers need to know different kinds of skills, knowledge, dispositions and values, which affect their proficiency. These requirements according to Reynolds (1992), de Leon (2001), Borko and Putnam (1995) and Shulman (1986) are: general pedagogical knowledge, subject-matter knowledge, knowledge of student's context, ability to bridge theory and practice, external evaluation of learning and knowledge of strategies, techniques and tools to create and sustain a learning environment/ community, and the ability to use them effectively.

Since the objectives of TVE are to raise the standard of general education and to provide professional skills, teacher trainees should be given a more adequate cultural foundation (mother tongue, modern languages, social sciences, etc.) there should also be more emphasis on pedagogical skills. It was never safe to assume that competence in a vocational specialisation was enough to ensure effective classroom teaching, particularly in catering for the wide range of abilities and backgrounds characteristic of classes today (Banks 1996). The problem of how technical and vocational teachers could best keep their professional skills up-to-date became more intractable with the increasing pace of technological change. In the extreme case teachers have to be totally re-trained because the world of work is changing radically.

The qualifications of teachers at technical and vocational schools and training centres are different from those of the general education sector (Schrembs 2001). Chappell and Johnston (2003) advocate that TVET teachers and trainers have multiple identities. They have one identify located in being an industry specialist, with a detailed knowledge of a specific industry, its history, current challenges, equipment and training systems. Callan (2005) identified five required capability areas for TVET teaching staff: expertise in teaching and learning (e.g. demonstrates an understanding of a range of learning theories and techniques that inform practice, adapts learning and teaching strategies to suit individual students and learners); flexible delivery and assessment (e.g. able to factor on-site assessment to suit the systems of the workplace, has knowledge and skills in forms of flexible delivery, including distances, blended, on-line or work-based learning); learner support (e.g. able to customise learning resources for groups and personalise for individuals, knowledge of a range of behaviour management strategies for responding with difficult people); and industry currency (e.g. demonstrates a technical expertise in their subject area, able to partner with industry).
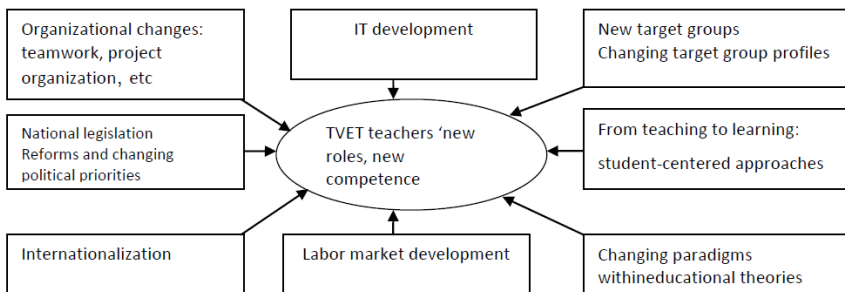

Figure 1: Professionalization of TVET Teacher. Source: Härkönen and Volmari (2004)

Dickie et al. (2004) draws the following areas of capabilities for TVET teachers from the material they reviewed:

- Pedagogical expertise: This includes the capacity to adapt learning and teaching strategies to suit individual learners, pedagogical understanding and access to a range of learning theories and techniques.
- Learner focus: This includes the ability to promote and support self-directed learning, as well as to teaching for TVE, and enable lifelong learn-

ing. However, a learner-focused approach is not the same as learner-centered learning in which the TVET teacher is but one of a range of resources available to the learner.

- Client orientation: This involves brokering and relationship-building skills, to enable teachers to provide advice to clients (including learners and enterprises), establish and maintain relationships, network with industry, develop partnerships, and customise training and delivery to meet client needs, and evaluate and monitor outcomes.
- Industry currency: Vocational expertise in the teacher's subject area is as critical as pedagogical expertise. This is particularly important as it is highly valued by employers and learners alike. However, increasing demand for generic skills by employers means that teachers need to be able to balance delivery of technical and industry specific skills with generic employability skills.
- Use of technology: This covers knowledge and expertise in using new and emerging technologies, in particular to stay in touch with and advise learners, as well as for flexible delivery. These skills are also important to enable TVET teachers to 'stay in touch' with each other, including via communities of practice and other networks, and can help to combat the isolation many teachers experience.
- Personal qualities and attributes: Personal attributes are identified as being absolutely critical for all TVET teachers. Communication skills, a commitment to self-development, a capacity to deal with change, self-directed learning, managing time and managing knowledge are all seen as important.

Schrembs (2001) has stated that an instructor has to have a variety of competencies such as:

- *Personal competencies:* Instructors are not born as instructors, they have to be trained. Apart from abilities that can be trained, a teacher should have some character capabilities. Some instructor has a well-balanced personality. This will help trainees to build up confidence in the instructor and lead to a good mood in the classroom. He/she should have natural authority and be able to guide young people. Stolte (2009) has stated others personal competencies such as readiness for change, emotional stability, resilience, diligence, personal commitment and responsibility for own decisions.
- *Pedagogical Competencies:* This type of qualities can be acquired during the teacher training course. It can be regarded as the contents of a

teacher's apprenticeship. First of all a teacher must be able to choose the correct and most important topics of a trade. Not everything can be learnt within the period of training. The second step is to group these topics into logical units and prepare proper lessons with it. Planning and running a lesson requires competencies in the whole field of teaching techniques. He should be able to transfer theoretical knowledge as well as practical skills.

- ▪ *Professional Competencies* These abilities include the professional skills. A teacher should have acquired them during his own apprenticeship as a craftsman and his working experience. He/she must be a master of his/her trade. To be a master does mean being a model. It is not enough to be a craftsman but a good craftsman. An instructor should always keep his/her eyes open for changes and developments in his/her trade. Instructors should always be up-to-date and interested in further training and upgrading. It is very necessary to have a wide range of general knowledge too.

TVET teachers must be effective users of information and educational technology, if they are to become 'learning facilitators' in a connected world of universal information. The UNESCO (2004b) proposed a program of building capacity of teachers to implement ICT (Information and Communications Technology) in their teaching process throughout the world. The suggested framework for the professional development of teachers consists of four main approaches: Emerging, Applying, Infusing, and Transforming. These approaches were illustrated in the below figure:
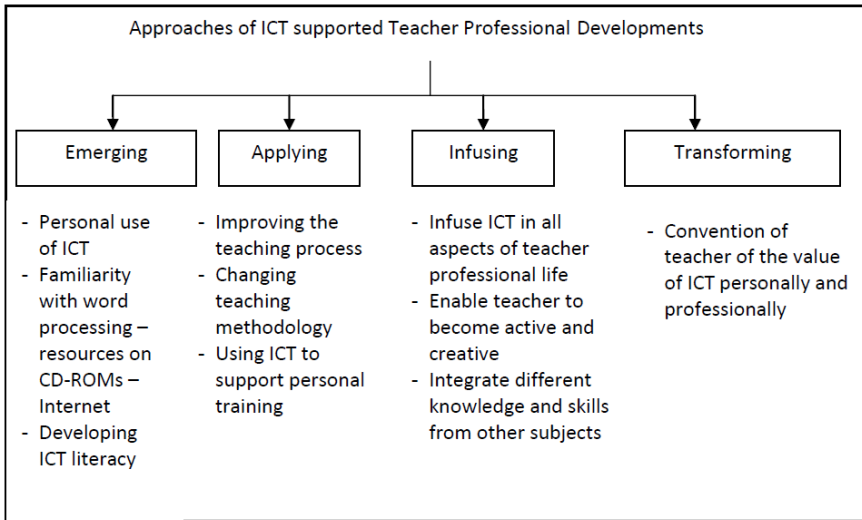
Figure 2: ICT supported Teacher Professionalisation. Source: Unesco (2004b)

3   Overview of Teacher Education Programme

Education system in India comprises of primary, middle/ elementary, secondary, higher secondary and higher education. Primary education is of five years of school class 1 to 5 with entry age of five years. Middle level is from 6th to 8th class (see chapter 2). Secondary level is of class 9th to 10th and higher secondary is of 11th and 12th class (see chapter 3) After higher secondary, higher education at bachelor and master level starts (see chapter 5 and 6). For the development of skilled workforce, another stream is TVE, which is comprised of three years of education after matriculation/ 10th class and vocational training certificate courses of six months, 12 months and 18 months duration after 8th class or 10th class. These diploma and certificates are offered in almost all technologies for both girls and boys throughout the country.

Vocationalisation primary aims at equipping the youth with such manual skills founded on basic scientific principles as would be needed in to-day's society and with capacity to adopt to ever-changing scientific and technological developments. Employability is the corner stone of the new system of vocationalised education. Vocationalisation is looked upon as an effective instrument to prepare middle level manpower who would not merely be superior to skilled workers but who would work with their brains as well as their hands. There are a large number

of employment opportunities for which there are no suitably qualified persons with appropriate skills, knowledge and competencies.

A number of committees and commissions have been formed from time to time to consider the prevailing educational system and to make recommendations for progress. It was first recommended even in 1882 by the Indian Education Commissioner the Hunter Commission, that the curriculum of the secondary education should be split up into A and B curriculums; curriculum A to have subjects that were to be useful for higher studies and curriculum B to have vocational occupational and practical subject. The Hartog committee (1929) recommended that more boys should be diverted to industrial and commercial career at the end of the middle stage. The Sapru Committee (1934) recommended diversified courses at the secondary stage, preparing students for university education and providing vocational education. The Abot and Wood Report (1937) recommended that the nature of vocational education should be determined by the prevailing circumstances in view of the multi-various needs of the locality. The Sargent report of 1944 recommended that the high schools will be divided into two classes: (i) academic high schools, (ii) technical high schools. The Secondary Education Commission, 1948-49, stressed the need for vocational education. The Kothari Commission, 1964-66, recommended introduction of vocational stream along with the traditional academic stream at the higher secondary or plus two, one preparing students through a two-year programme for university education and the other through vocational courses of various durations. Such products can perform a large number of middle level jobs which now are being performed by the university graduates. In 1976 the NCERT (National Council of Educational Research and Training) document "Higher Secondary Education and its Vocationalisation" was presented to the country setting out a model conceptual framework for implementation. The programme for Vocationalisation of higher education was initiated in 1976 (see chapter 3).

In India vocational education aims to develop skilled manpower through diversified courses to meet the requirement primarily the unorganised sector and to inculcate self-employment skills in children through a large number of diversified vocational courses. Given that only 7-10% of population is engaged in formal sector of economy (NSS, Govt. of India 2005); development of vocational education will provide skilled labour force in the informal sector which would further enhance the productivity (see chapter 12). In India, the general education and vocational education have been operating as two different verticals with very little interaction between the two. This had led to hesitation in students opting vocational courses as there is a general apprehension that one cannot pursue higher degrees or qualification.

The Vocationalisation of secondary education scheme was revised in 2014 to address the issue of weak synergy with industry in planning and execution, lack of vertical and horizontal mobility, redundant courses and curricula as well as paucity of trained vocational educational teachers. The National Skills Qualification Framework (NSQF) has been notified in December 2013, to provide an overall framework to set up vocational education programme. There is a greater emphasis on integrating skills in education and a renewed focus on vocational education in secondary education. It also demands of a revamp of our education system to make skill development an integral part of curriculum (see chapter 13).

In order to provide all these vocations first thing needed is expertise faculty in all these areas. So the training of personnel for instructional resource, should be organised by NCERT, SCERTs (State Council of Educational Research and Training), TTTIs (Technical Teacher's Training Institutes), RCEs (Regional College of Education), CDCs (Curriculum Development Cells), CIVEs (Central Institutes of Vocational Education), SCVEs (State Council of Vocational Education) etc., beside all these if Bachelor of Education (B. Ed) programme itself designed with some vocation's definitely the resource persons can be outputted.
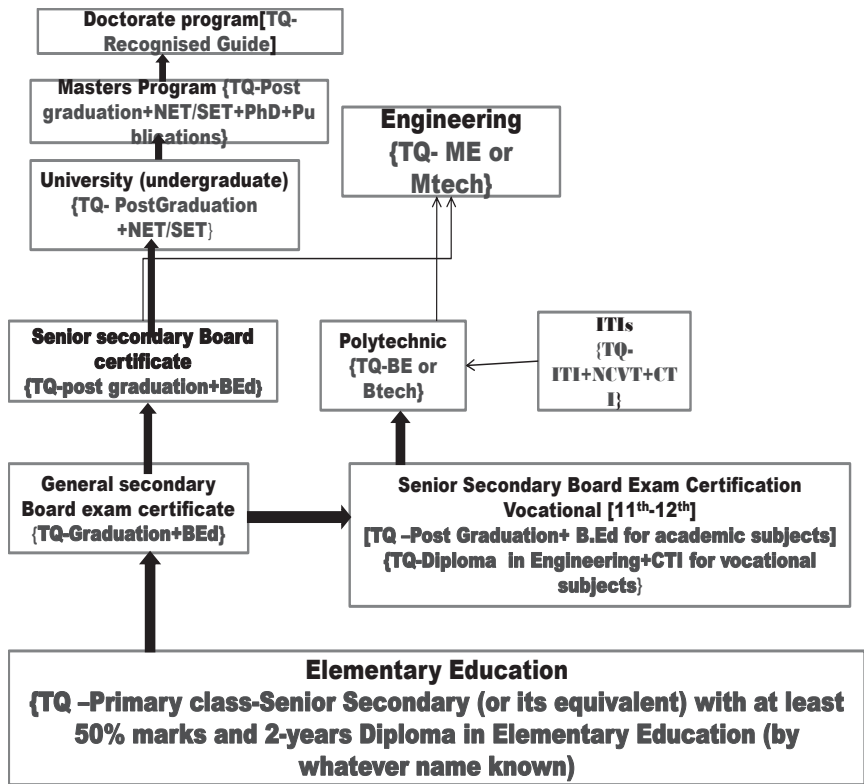
TQ (Teacher Qualification, NET (National Eligibility Test), SET (State Eligibility Test), ME (Master of Engineering), NCVT (National Council for Vocational Training), CITS (Craft Instructor Training Scheme)

Figure 3: Teacher Qualification required at different Levels of Education in India. Source*:* Skill development in India: The vocational education and training system report No. 22 World Bank (adapted by Ajithkumar)

3.1   Inceptions of Technical Teachers Training Programme

The Planning Commission notes (2011) that there is around 9,400+ institutes (ITIs, ITCs etc.) imparting training under the purview of Directorate General of Employment & Training (DGET)/ NCVT of the Ministry of Labour and Employment (see chapter 4). It is required that teacher/trainers in the public technical institutes complete a Crafts Instructor Training programme. Duration of the course vary from six months to three years, and entry to these courses can be made after Class 8, 10 or 12 depending on the trade in question (Planning Commission 2011). These courses are conducted across various vocational professions such as welder, machinist, and draftsperson among many others.

National Institute of Technical Teachers Training and Research (NITTTR) was set up in the year 1967 by MHRD (Ministry of Human Resource Development), Government of India, to bring qualitative improvement in technical education especially in the northern region of the country. The institute caters to the needs of education and training of faculty and staff, curriculum development, instructional material development, and research and development of technical institutions (both degree and diploma level) in the northern region. NITTTR offers long-term programmes (ME/MTech) in six disciplines namely: Engineering Education, Computer Science and Engineering, Construction Technology and Management, Instrumentation and Control, Electronics and Communication Engineering and Manufacturing Technology. Short term courses and workshops are offered to support the training of new recruits and in-service personnel, in areas such 'emerging rural and appropriate technologies', 'research capability', 'instructional materials development', 'computer education'. NITTTR also consults with the State authorities to identify areas for polytechnic staff development.

The AICTE (All India Council for Technical Education) offers several schemes and scholarships to encourage the professional development of aspiring or existing technical teachers, although these have strong academic and research oriented focus – e.g. 'Early Faculty Induction Scheme', 'Quality Improvement Programme' (QIP)', 'Faculty Development Programmers'. AICTE encourages professional development through NITTTR short courses as well.

The DGET in Ministry of Labour& Employment is the apex organisation for development and coordination at National level for the programmes relating to vocational training including Women's Vocational Training and Employment Services. DGET also operates Vocational Training Schemes in some of the specialised areas through field institutes under its direct control. Development of these programmes at national level, particularly in the area concerning common policies, common standards and procedures, training of instructors and trade testing are the responsibility of the DGET.

Under its Schemes for Training of Trainers it conducts

- CITS
- Hi-Tech Training Scheme (HTS)

3.1.1   Craft Instructor Training Scheme

The CITS is operational since inception of the Craftsmen Training Scheme. The objective of the Craft Instructor Training is to train Instructors in the techniques of transferring hands-on skills, in order to train semi-skilled/skilled manpower for industry. A comprehensive training both in skill development and training methodology is imparted to the trainees.

Under the programme, instructors from Government and Private ITIs Centres established by industries under the Apprentices Act are provided training. Training in 29 Engineering trades is being offered in these institutes. To increase the seating capacity under Crafts Instructor Training Programme second shift w.e.f. November, 2012 has been started. During year 2010 government also allowed setting up of the Instructor Training Institute by State/ UT Governments, companies like sole propriety, private/public limited registered under companies Act, Societies and Trusts registered as per Act, and promoters of SEZs (Special Economic Zones). On completion of the training trainees are trade tested and awarded National Craft Instructor Certificate. In order to maintain quality and standards of Instructor Training, NCVT has approved separate standards for infrastructure and course curriculum. The institutes meeting the standards would be affiliated with NCVT (see chapter 13).

To make instructor training more flexible, modular pattern of Craft Instructor Training in place of conventional one year training has been introduced in CITS and Advanced Training Institutes (ATIs) with effect from session started from August, 2009. Under the modular concept, multi entry and multi exit provision has been made to make programme flexible so that instructor can take up training in any of these modules at any of the institutes as per his convenience.

A network of institutes, both under Central and State Governments, has been setup to extend vocational training facilities solely to women, which aim at stimulating employment opportunities among women of various socio-economic levels and different age groups.

3.1.2   Hi-Tech Training Scheme

HTS is one of the schemes of the erstwhile World Bank assisted Vocational Training Project. The scheme is now being continued for implementation with Government of India funding. The objective of the HTS is to produce trained personnel with the range of skills necessary to meet the requirements of industry, commerce and domestic consumers in the application of electronics, computer and the modern production system.

Short-term courses of two to three weeks duration in the Hi-tech areas like CAD/CAM, CNC & Control Technology, MC&PLCs are being implemented in the ATIs/Advanced Training Institute for Electronics and Process Instrumentation (ATI-EPI) for the industries/ Public Sector Undertakings/ Government organisations/ Trainers from the institutes/industries etc.

Since 2000-2001, ATIs have trained 1,500 persons under the HTS (DGET 2010).

3.2   *New Initiatives of Staff Development in Technical and Vocational Education and Training*

Rapid changes in technology call for change in courses and curriculum. The Ministry of Labour and Employment constituted Mentor Councils consisting of representatives from academia, industry and domain experts in 25 sectors. Mentor Councils recommend changes in curriculum, requirement of equipment, pedagogy and assessment of various courses that are being run by the Ministry in their respective sectors. It is required to train the existing instructors with revised/updated curriculum. Considering the quantum of efforts required to update the existing faculty and the stiff time constraints, use of Distance Learning through technology has been considered by the Ministry.

Extensive study was done by DGET to choose the right technology for distance learning. Certain criteria such as latest technology that provides extensive reach, high quality two way real time communications and easy scalability were kept in mind for selection. Communication between teacher and students through Internet using software such as A-VIEW was found to be the best solution for DGETs requirements.

A hub and spoke model is to be followed for delivery of the training. Training is transmitted from the hub and received at the spokes (remote centres). DGET plans to set up ten hubs and 200 remote centres spread across India.

For providing training, NITTTR develops its Programme Calendar on the basis of Training Need Analysis of the various stakeholders like Technical Institutions, Directorates of Technical Education, industry etc. The calendar so developed is shared with all concerned to enable participation of the right person for the right kind of programme, before implementation. Various kinds of programme are offered specially for the total development of teachers/supporting staff of technical institutions so that they can play multiple roles such as effective teaching, curriculum development, instructional material development, infrastructure development, student evaluation, guidance and counselling, community interaction and consultancy. The programmes are offered in a very flexible manner to suit the convenience of the clients with respect to duration (sometimes made modular) venue and timings. The Institute also invites faculty members from institutions of higher learning and industry for providing a variety of experience and exposure to the participant, on one hand, and for ensuring quality, on the other.

3.2.1   Short Term Training Programmes (STTPs)

The Institute Conducts STTPs typically of one week duration for in-service teachers and staff members of technical institutions, i.e., Polytechnics and Engineering Colleges all over India. These training programmes are spread over the entire academic year. AICTE has recognised the STTPs conducted by the Institute for consideration for the purpose of movement to higher grades under Career Advancement Scheme.

3.2.2   In-House Training Programmes

In addition to STTPs mentioned in the Programme calendars, the Institute also conduct clientele demand based STTPs.

3.2.3   Special Training Programmes

Tailor-made training Programmes/Workshops are conducted to cater to the special needs felt by the Directorates of Technical Education or organisations/ industry.

3.2.4   Collaborative Training Programmes

Such programmes are conducted in collaboration with technical institutions/ industries by sharing of resources. The Institute has organised such programmes in collaboration with national and international organisations like Colombo Plan Staff College, United Nations Educational, Scientific & Cultural Organisation, United Nations International Children's Emergency Fund, United Nations Development Programme and various reputed technical institutions.

3.3   *Latest Update in Craft Instructor Training Scheme*

From 2015, the ITI is under the new ministry, Ministry of Skill Development & Entrepreneurship. The Ministry is responsible for co-ordination of all skill development efforts across the country, removal of disconnect between demand and supply of skilled manpower, building the vocational and technical training framework, skill up-gradation, building of new skills, and innovative thinking not only for existing jobs but also jobs that are to be created. The DGET is appellate Directorate General of Training (DGT) and is under the Ministry of Skill Development & Entrepreneurship (Ministry of Skill Development & Entrepreneurship 2015).

      The structure of the training Programme has been converted into Semester system in place of Modular pattern, w.e.f. August 2013. The courses have been designed to impart basic skills and knowledge in the trades so as to prepare trainee for employment as a semi-skilled worker or for self-employment. As the emphasis is on skill building 70% of the training period is allotted to practical training and the rest to subjects relating to Trade Theory, Workshop Calculation & Science and Engineering Drawing. For overall personality development of trainees, a course on 'Employability Skill' has been introduced from session July 2012.

      All India Common Entrance Examination for CITS Courses is to be conducted from August 2015 Session.

      In order to create a pool of trained trainers from academic session 2015, CITS will be conducted in 25 institutes like ATIs, ATIEPIs (Advanced Training Institute for Electronics and Process Instrumentation), CITS, National Vocational Training Institute (NVTI), Regional Vocational Training Institutes (RVTIs) and Foremen Training Institute (FTI) and 17 Private Institute of Training of Trainers (ITOT).

      Total Seating capacity of the ATIs/ ATIEPIs/ CITS/ FTI + NVTI/ RVTIs + Private ITOTs is 11,052 in 2015 (data compiled from DGET report 2015).

4   Perception of Teachers regarding Effectiveness of Pre-service and In-service Teacher Training (Research Based)

In India, TVET teachers especially those recruited in private ITIs (there are 2,133 government run ITIs and 5,906 private ITIs catering to a student population of 1,115,628) (DGET 2010) are traditionally, technicians and engineer/technologist whose major training is concentrated on technical areas but with fewer being trained as teachers and trainers (see chapter 4). These modes of recruitment of trainers have not been without associated problems. With the National Policy for Skill Development and Entrepreneurship 2015, aiming to provide skills to 402 million people by 2022 (National Policy for Skill Development and Entrepreneurship 2015), the ITIs have got a definite push. The role of the government should be to provide the right environment for skill development to happen. An important step in this direction must begin with teacher preparation. Without qualified and well-experienced TVET teachers and trainers to plan for and execute TVET programs not much can be realised at the grassroots. There is a need for higher level trained TVET experts to provide the professional academic and research leadership in the field to support policy formulation, planning, development and implementation.

With regard to TVET teachers in India, there is no recent study to highlight the perception of TVET trainers about the pre-service and in-service training programme. Therefore, this study will focus on this aspect.

4.1   Objectives of the study

The general objectives of this study were:

- To investigate the capacity building of teachers and trainers in (TVET) in Maharashtra, India.
- To investigate the teacher professional development through in-service training.
- To study the competences of teachers and trainers in regard to ICT use.

4.2   Research Questions

The following research questions were set:

- Have the TVET trainers participated in initial and pre-service training?
- To what extent the pre-service training's programs meet the professional development of teachers and trainers?
- Is the ICT considered as a part of the current initial teacher training programs?
- To what extent the integration of ICTs in learning and teaching process improves competencies of TVET teachers?
- Is there re-training program for old teachers?

4.3   Data Sources

This research has depended heavily on primary data collected through structured questionnaire to obtain information from a group of teachers in ITIs. Personal interviews are conducted with policy maker and principals. The study was conducted between March to July 2015.

4.4   Sample

The population of this study is all teachers and trainers who are working in the vocational training centres and ITIs in Maharashtra state. This study includes trainers of ITIs and principals of Maharashtra State, Mumbai region.

Name of institute	Total faculty	Sample	Done pre-service training
St Joseph ITI, Mumbai	21	11	4
Fr Agnel ITI, Thane	11	8	2
Gurukul ITI and Vocational School, Mumbai	8	5	2
KJSomaiya ITI Mumbai	14	12	2
Joseph Cardijn Technical School, Mumbai	12	11	3
Total	66	47	13

Table 2: Size and Composition of Sample of Study. Source: own study

Semi-open ended interviews as a tool of data collection are also used for this study while interviewing the six principals and a policy maker.

4.5   Analysis of Data

Results of this study are interpreted using descriptive statistics (frequencies and percentages) so as to give general overview of the study variables. The data is arranged under three main themes corresponding to the objectives of the study. First theme is the current situation of training programs (Institutional setup, initial and in-service training programs), secondly, integration of ICTs on teaching/learning process and teachers ICT competence and thirdly, testimony of principals and Deputy Director, ATI, Mumbai.

4.6   Profile of the Technical and Vocational Education and Training Trainers

The TVET trainers in the study are between ages of 26 and 58 years, predominantly male (92%) and holder of Diploma certificate 67% and 33% were merely NCVT certificate holders. As much as the profile is one of youthfulness there is a good blend of maturity as 41% were reported to be in the ages between 40 and 60. The duration of teaching of five years or less at 66% and those greater than five years at 34%. All the respondents worked in private ITIs.

4.7   Initial and pre-service training of the Technical and Vocational Education and Training Trainers

Only 27% trainers, among the respondents had undergone pre-service training in ATI. The principals reported lack of availability of CITS holders. The principals reported inadequate number of ATI, inaccessibility of ATIs in terms of geographical location and difficulty in relieving staff for one year. 90% of trainers indicated that there were no incentives for professional upgrading that included paid leave, salary increments and promotions.
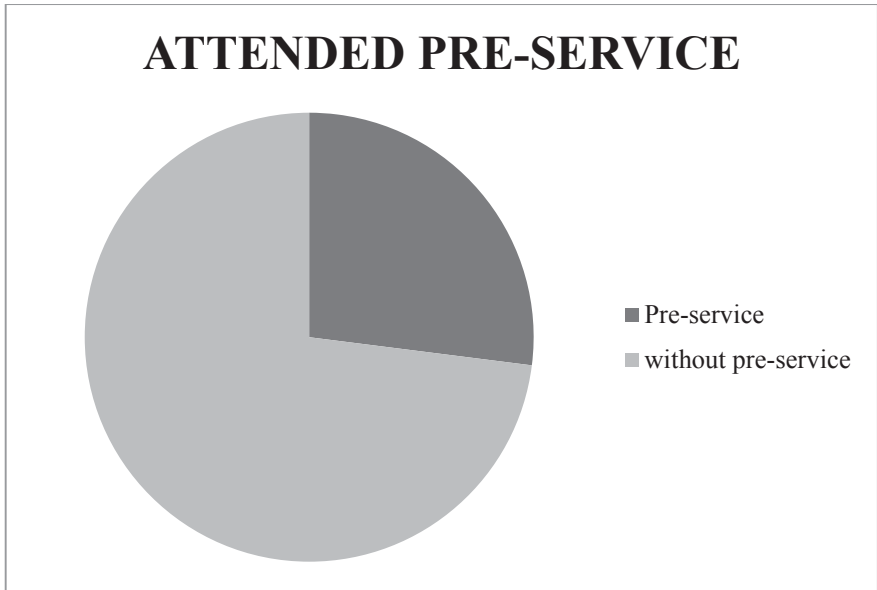
Figure 4: Data Representation of Faculty attended Pre-service Training. Source: research findings by author

4.8   *Pre-service Training Programmes and the Professional Development of Trainers*

90% felt the training method, practical training they received at ATIs, internship in industry, quality of instruction they received at ATIs during the pre-service training was excellent.
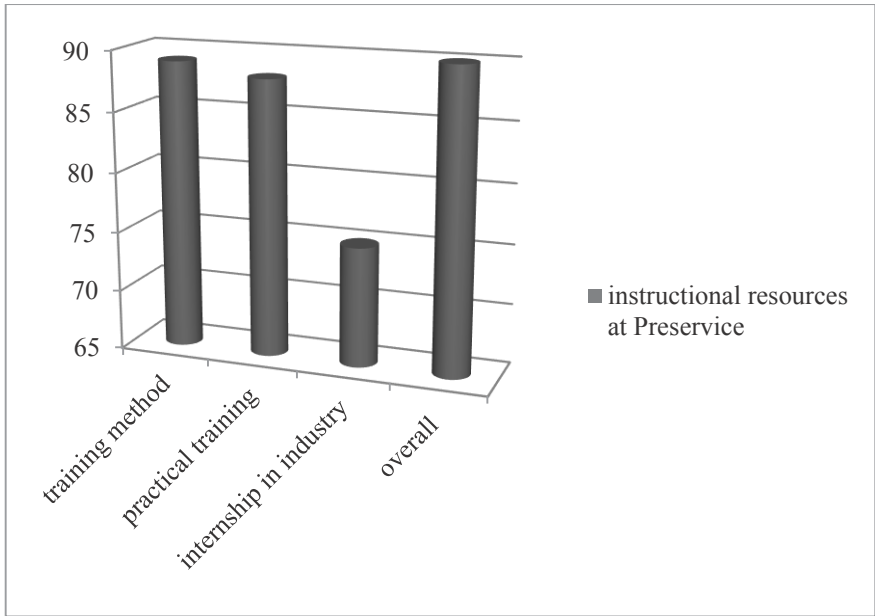
Figure 5: Representation of Feedback about the Pre-service Training Programme. Source: research findings by author

4.9   *Information and Communications Technology and Current Initial Training Programmes*

100% reported ICT was not part of the pre-service training programme. 100% acknowledged the importance of ICT. The deputy director of ATI, Mumbai reported that AVA (Audio Visual Aids) is part of the curriculum and this takes care of ICT.

TVET trainers constantly face changes in technology within their teaching domain. This aspect of the profession is inherent and every TVET trainers need to adapt to ensure that their trainees meet the needs of the labour market. The alternative is to gradually become irrelevant professionally.

Respondents indicated that they stayed up to date with changing technology through the internet 57%, workshops and seminars 41% and through research 2%. It is interesting that over half of the respondents proposed the internet as their avenue for staying in touch. It would be the most up to date in the materials avail-

able but more importantly allows for individually driven self-learning, clearly suggesting that respondents are already aware of the need to personally be responsible for their lifelong learning. When asked how they reflected new technology in their teaching, 60% of the respondents said they would wait for it to be reflected in the syllabus while 36% said they would update their teaching notes and 4% citing appropriate examples. Clearly the majority appreciates the need to adjust the contents of their teaching and not necessary wait for curriculum changes which have generally a longer revision cycle than the evolving technology.
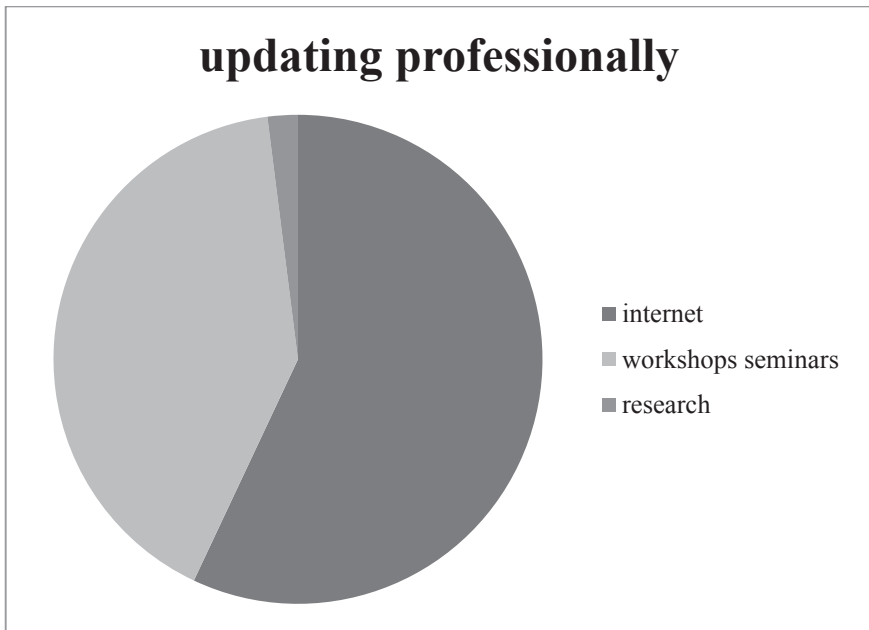

Figure 6: Representation of Methods of Updating Professionally. Source: research findings by author

4.10   *Further Training of Technical and Vocational Education and Training Trainers*

Since completing the initial training, not a single trainer was deputed for any refresher course at the ATIs. However, all of TVET teachers indicated that they had subsequently attended some kind of professional development programmes like

talk by experts, visit to industry, training at industry, personality development programme, soft skills training programme conducted by their institutions. 100% reported such professional development programmes were inadequate.

A large number of TVET trainers interviewed, 68%, reported that they had acquired industrial work experience of only six months or less; 26% had work experience of between 12 months and 24 months and 6% had work experience of over 24 months. The majority of the respondents worked at the tertiary level and was responsible for training learners preparing for direct entry into the workforce. All the trainers acknowledged the importance of industrial work experience. Without adequate initial work experience and regular updating a teacher will fail to reflect and demonstrate the appropriate work context to his or her students. Industrial attachment was also ranked the highest at 81% as the most effective way of staying in contact with industry. A full two thirds of the respondents indicated they felt more comfortable teaching theory than practical. This could be a reflection of inadequate industrial work experience.
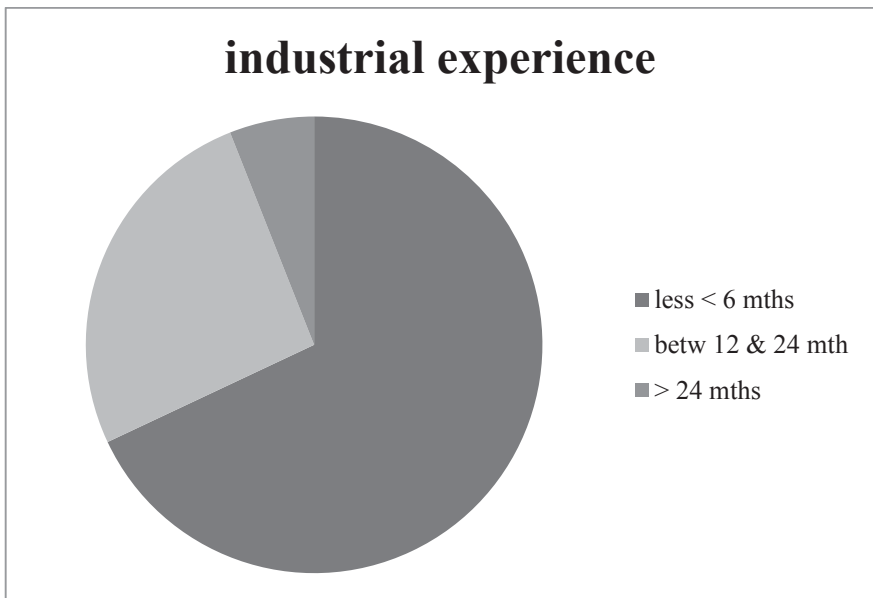

Figure 7: Representation of Industrial Experience of the Respondents. Source: research findings by author

4.11   Testimony of Principals about Staff Capacity Building

BOX – I

Mr. Mayur S. Yaul
Principal Parshuram Private Industrial Training Institute Nagpur, Maharashtra

"It's All Work & No Play For The ITI Instructors"
Indian economy has started growing and all the sectors of industry are registering growth and thus there is a huge demand of skilled man power. Industrial Training Institutes commonly abbreviated as ITI's are striving hard in meeting this demand of skilled man power by imparting training in all major sectors like Electrical, Mechanical, Civil, Electronics, as well as Hospitality management etc. ITI's are the backbone of the industry and if the support i.e. the instructors of these ITI's are not trained as per what the industry needs the whole system would slag. As technical aspects of the industry change, instructors must stay up-to-date on new technologies and techniques. In the current scenario, the inclination towards taking up an ITI instructor Job is less since way of looking towards the same is not as one looks towards teaching in a school, polytechnic or engineering college. The eligibility to teach in ITI is Diploma or ITI with CITS. Since the curriculum of ITI is practical oriented the candidate who has done ITI with CITS is apt for teaching in ITI's as they are aware of the practicalities during teaching an ITI student. Further the ITI instructors should be trained on Soft Skills & Personality Development Skills. They students who take up ITI courses need is the product the industry is going to take and they should understand how the language of Industry, soft skill & personality development training to teachers will enable them to impart the same to their students. Short term certificate courses that are relevant to their subjects should be made available for the instructors; this would keep them up to date with the market needs and enhance their skills, which would in turn help their students. Physical training (Sports) should be a part of curriculum as its all work and no play for the ITI instructors. The Industry and ITI's should work out a module together to impart training to the instructors about the current trends in the industry, which in turn can be imparted to the students. This would make the students industry ready i.e. the students when employed will not need a special training and can start working immediately. This would save industry's time, effort and money that is spent in training and induction of the newly employed. The best example of the same is the "GURU SHIKSHA" a first of its kind initiative to train teachers of ITIs located in Delhi NCR on troubleshooting, installation and demonstration of Samsung products including mobile phones and home appliances. A similar type of course is conducted by KEC International, Butiori Nagpur for enhancement the soft skills and confidence of the teachers in ITI's.

BOX - II

Testimony of Principal Mr. Amar Prabhu, St. Joseph ITI, Kurla

There are 21 ITI instructors in my institution of which all are NCVT trained. Only four have undergone CITS, the Craftsman Instructor's Training due to insufficient ATI (only six in India and one in Maharashtra) and limited seats in the ATIs. At St. Joseph we conduct robust selection process including written test, and personal interview, practical, demo lessons and psychometric tests. The teachers from the general stream have ample opportunity for pre-service training due to availability of D Ed, B.Ed colleges and the current TVET teacher-training situation is very bad. The principles of teaching, pedagogy is missing in the CITS training. Even the CITS curriculum needs to be revamped and ICT, pedagogy of teaching to be integrated in the modules of training. The ITI instructors are still using the traditional methods of teaching. We need 60:40 ratio of ICT integrated method and traditional method. Since in India we have limited number of ATI, it would be good idea to send the instructors for external training to countries like Germany, Japan though the feasibility is to be worked out. I personally feel the ATIs should provide training in the pedagogy and industry should provide practical training to the instructors. At ST. JOSEPH'S we also conduct regular in-service training for the faculty in the form of industrial training, industrial visits, and talks by experts, sessions on holistic development, experiential learning and also yoga, meditation. From my end, I take a personal initiative in upgrading the infrastructure required for the various trades at regular intervals so that students are equipped to learn and work with the latest equipment. This is evidenced with the fact that our Institute has installed the latest computers with additional software in line with the industry requirements. Visiting faculty is invited to train the students from the Draughtsman Mechanical batch in the latest software as per the industry demand.

We have also upgraded other trades like the Electrical, Mechanic Motor Vehicle by acquiring latest and modern equipment. Sometimes, due to funding problems, we invite our industry partners to help with providing the required equipment. I have also asked our industry partners to play a very active role in terms of imparting training in the latest technology so that the same is passed on to our students. Our Instructors have availed of training with the following industries:

- Grohe India Ltd. (plumbing)
- Ford India Ltd. (automobile)
- Toyota Kirloskar Ltd. (automobile)
- Schneider Industries Ltd. (electrical)

I have also introduced a practice to involve our students to avail of an On Job Training (OJT) for a period of two months with industry which will help students get hands on exposure with the working environment. They will get the benefit of the following.

- To get an additional OJT certificate from the industry.
- Most companies prefer to hire candidates with OJT experience when they look to hire a trainee and candidates with an OJT experience are preferred over candidates without.
- Candidates become more confident & are better equipped to face interviews.

BOX - III

Testimony of Mr. M.P. Nair, Deputy Director, Advanced Training Institute, Mumbai

The ATI is a field unit of the DGET, Ministry of Labour & Employment, Government of India. The history of the institute dates back to 1957, when it was started as Central Training Institute for instructors at Aundh, Pune. In the year 1963 it is shifted to present premises at Mumbai. The ATI at Mumbai conducts long term and short term courses. Short term courses are job oriented courses, conducted to upgrade and update the knowledge and skill of the technical personnel working in industries, ITI, Diploma holders, Fresh graduates or any one with technical qualification and sponsored by Industry or ITI. These short term courses are of one week to four week duration and conducted in 12 trades covering the fields of chemical, mechanical, electrical, electronics and instrumentation. The courses content of the short term courses are being revised, time to time, depending on the technological changes. Courses of 2015–2016 has been revised and new courses added in Advanced Welding, Machine Tool Maintenance and Unit Operation on the basis of feedback received from the participants and conducting need analysis from industries with the help of experts from industries.

The long term course is the Crafts Instruction Training Scheme (CITS). The objective of the CITS is to train ITI trainer in the techniques of transferring hands-on skills. The training is of one year duration, (two semesters) for the Government ITI trainer and sponsored private ITI trainers. Admission is offered twice in a year and from academic year 2015 centralized admission test is conducted. The intake capacity of this institution is 420 per year for the 12 trades available under CITS. The Institution also offers Tailor Made Courses i.e. need based training for industries, as per requirement of industry on their request utilizing the existing infrastructure of the institute. Tailor Made Courses in the fields of Metrology, Welding, Process Control Instrumentation, Hydraulics and Pneumatics, AC/DC Drives, Workshop Science and Skill, Multiskilling etc. have been conducted for Rites, Naval Dockyard Mumbai, Reliance Energy Ltd, Central Railway, BHEL, BEL, Fleet Maintenance Unit Naval Dockyard, BSNL, NALCO, MICO, BPCL, and various educational institutions. In addition I personally feel the ITI trainer training facility in India is good with now more institutions imparting training to the trainers and the curriculum adapting to the requirements of the changing world of work.

5   Conclusion

As India moves progressively towards becoming a 'knowledge economy' teachers and trainers will be the cornerstone in the whole process. Unless we rebuild their capacities, this new aspiration will not be achieved.

Based on the results of the survey the following important lessons can be gleaned.

- The average ITI trainers in the system are young or in mid-career with the majority being diploma holders. This has implication on the kinds of in service training or further education that could be organised to ensure that teachers are continually exposed to new technology, teaching strategies and industrial work experience.

- A good number of ITI trainers have yet to take advantage of existing opportunities in the country to further their professional training. The government and private management need to provide incentives and rewards for ITI trainers to access further training. This is absolutely critical in ITI teachers' profession due the rapidly developing technology. The principals showed reluctance in deputing trainers for in-service training and refresher courses as they are more concerned about curriculum transaction.

- Majority of the ITI trainers expressed the desirability of establishing active links between training institutions and the labour market to ensure the relevance of their training programmes. Unfortunately the same teachers reported weak links currently existed between their institutions and the labour market. Indeed institution heads and policymakers speak about this situation often. Much needs to be done to achieve the desired cooperation between institutions and the labour market. Clearly the initiative must come from the institutions reaching out to industry or the labour market.

- The majority of trainers had inadequate work experience, which is clearly an undesirable situation. With the reported weak institution-industry links, these teachers are unlikely to find viable and conducive opportunities for acquiring more work experience. Every effort should be made to ensure that the ITI trainers are exposed to a prescribed working experience in relevant environment.

- The curriculum change in ATI is lagging behind. This is clear from non-inclusion of ITC as a module and less emphasis on pedagogy of teaching.

- Without adequate initial training most of the trainers are not qualified in an academic sense and are not really equipped to be trainers. Added to this there is no practice of deputing trainers for retraining. The professional development programmes conducted by the ITIs are of little real value. Clearly, the capacity building of the trainers need to be given due priority.

- It was observed that nearly half of the respondents used the internet to access Information about new technology. This is important in cultivating the concept of lifelong learning and maintaining the relevance of ITI training and appreciating the developments of ICT. This is a positive development as curriculum changes tend to lag behind technological changes.

- The retraining of the TVET trainers is necessary to keep them fully informed of the developments in the job. Entirely new set of skills and new methodologies for delivery are emerging as among the greatest shifts in

paradigm in teacher educations but, none of the respondent who was sent for training once was deputed for retraining.

- ▪ The ATIs and other training institutions need to rethink their curricula, pedagogies, integration of the technology into curricula, to bring about the expected transformation and strengthen the standard of TVET teachers.

Currently, India does not have national body, which is responsible for developing competence in vocational education and training – although this need has been identified in various reports. However, there is a proposal (2013) for a feasibility study on the setting up a Centre of Excellence in Vocational Teacher Training in India under the auspices of the Australian India Education Council (with the NSDC [National Skill Development Corporation]).

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