

Human Resource Development (HRD) in Technical & Vocational Education & Training (TVET) of Pakistan

**Policy Paper
December 2012**

TVET Reform Support Programme



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Foreword

One of the most important factors in any educational institution or training school is the quality of the teaching faculty. The faculty, being the agent for imparting skills and learning, can create a dynamic of excellence or become tied to routine and mediocrity. It is the role of the faculty that determines the quality of students or trainees and the reputation of the institution. This is especially true for the Technical and Vocational Education and Training (TVET) sector where the students are not only educated in a classroom environment but also guided in actual work-shop conditions for hands-on training.

The TVET sector in Pakistan is being accorded much-delayed attention. As such attendant issues like the type of training imparted, the competence of the pass-outs and their relevance to the current technical manpower needs of the country and acceptability in international labour market, are all dependent on the quality of the faculty in TVET institutions. Employability, in the domestic and international markets, has highlighted the necessity of raising the quality of trainers and tuning their competencies to produce technically qualified workforce.

The role of the National Vocational and Technical Training Commission (NAVTTC), as contained in its *Act of 2011*, empowers it to address the core issue of Human Resource Development (HRD). NAVTTC, shortly after its creation as NAVTEC, had initiated a consultative process with a spectrum of stakeholders and experts at the provincial and federal levels. A policy paper has been prepared in collaboration with the TVET Reform Support Programme. The consultative procedure was meticulous and comprehensive including provincial and federal stakeholders. Aware of the current complications in the HRD area, this document proposes the way forward. It is hoped that the administrators and policy makers will be facilitated to take important, indeed crucial, steps to streamline HRD for a more productive delivery system.

NAVTTC is grateful to the numerous individuals, public and private sector TVET stakeholders for their inputs and to international organizations and agencies, especially GIZ, for their continued support.

(Tariq Shafi Chak)
Executive Director

1. The objective of the policy paper

Pakistan is facing challenges in all spheres of society, but those in the economic and social development sectors are particularly important. A crucial aspect of the latter is the development of the Technical and Vocational Education and Training (TVET) system of the country. At present vocational education is offered at 3,059 public and private training institutions. But they have a limited number of training profiles (trades) and can provide training only to a small percentage of a very fast growing young population. The current TVET system has not kept pace with the training needs of the market. Nor has it adequately addressed the demographic trend. It is lacking in both capacity and quality of training. Furthermore, links with the demands of the national economy and the provision of employment chances abroad are almost non-existent. Therefore the Government of Pakistan launched an ambitious campaign for TVET sector reform.

The National Skills Strategy (NSS) 2009 – 2013 states that the quality and quantity of TVET teachers and trainers is fundamental to the effectiveness and sustainability of the TVET system. The NSS contains key indicators for the quality improvement of TVET staff, some of which are the number of pedagogically and trade-specific trained instructors in the pre-service and in-service stream and the number of trained managers of institutions. The NSS comprises the following TVET staff-related activities[#]:

- Upgrading knowledge in new technologies as well as upgrading teaching and assessment skills in competency-based training approaches;
- Developing competency standards for teachers and assessors;
- Introducing a comprehensive trainers and assessors training programme;
- Establishing a system of continuing professional development for teachers which will combine workplace experience and professional development;
- Considering incentives to attract qualified, experienced people into teaching and encourage them to undergo continuing professional development;
- Strengthening staff training institutes in terms of equipment and variety and quality of courses.

The concept of a National Qualification System for Teachers (NQST) had already been developed and was presented on July 25, 2007. It describes instructors' qualifications for entry into TVET teaching, a structure for continuous professional development and a staffing structure for different levels of courses. In addition, the framework sets out financial incentives for trained instructors.[#] The NQST was developed in close coordination with several expert groups at the Federal and Provincial levels. It has not yet been put into practice but it had foreseen solutions for HRD (see chapter 4) not far from those presented here.

In order to promote the initial training and continuing training of human resources for TVET in the frame of the NSS, a policy paper is under preparation. It is supported by the TVET Reform Support Programme and will focus on:

- guidelines leading to competitive technical and pedagogical competence levels of the TVET staff as well as to recruitment processes and working conditions allowing permanent adaptation to the advancing technologies and challenging skills demands of the labour markets;
- options for a TVET staff pre-service training system, being sustainable in terms of demand – supply rate, geographical equity, affordable costs and ensuring

- practical technical workplace experience combined with ‘mastership’ in technical and vocational training methods;
- further development of the in-service training system of TVET staff keeping in view the pros and cons of different concepts and structures of in-service training;
- accentuation of life-long learning as an important characteristic of new TVET staff generation as well as the development of its capacity to use Open Educational Resources (OER);
- recommendations and outline of a plan to develop career opportunities for TVET staff;
- reflections and recommendations on measures to improve the social status of TVET staff;
- suggestions for the revision of regulations of employment and professional development of staff in public and private TVET institutions.

The following paper is focused on recommendations to adapt the existing teacher training system to the demands enunciated in the NSS. It is not, and it cannot yet be, the implementation procedure for an adapted pre-service and in-service training that has to be managed by expert teams if the policy is approved. The implementation shall also be closely linked to the output and experience of the teachers training measure initiated in May 2012. The already started provision of modern pedagogical in-service training for up to 10,000 employed teachers shall support the new in-service concept with a first sample of up to 100 lead trainers/e-tutors.

2. Economic and social reasons for HRD in TVET

Economic and social development in Pakistan has wide-ranging implications for both TVET as a system and the education and qualification of the human resources in the system, especially the teachers. Two political decisions that have already been placed on the agenda by the NQST will be:

1. The acceptance of diversified profiles and levels of teachers depending on the levels and compositions of trades, from GI-GII level, via DAE to the Bachelors for some selected trades (at the beginning may be for IT, car-mechtronics and industry-electronics).
2. The Bachelor for Technical Education and a Master for Technical Education to generate more qualified teachers at higher level and scientific staff for research and development in TVET, for teaching staff at universities in pedagogy for TVET, for higher management positions, and as HRD personnel for large industries.

The proposal that “The teacher’s qualification is one level above the trainee’s” does not fully address the requirements of the new training schemes. The demand for higher levels of teaching competence and academic qualification is much more influenced by economic indicators as expressed, for instance in the *Industrialization of Pakistan: Roadmap to 2015 (Roadmap)*. The *Roadmap* connects the demand of TVET and its HRD to the focal sectors of the industry (like export industries, “sunshine” industries and high-value agro-industry), to the urgently needed research and development alliance of industry, universities and public research programmes and to the outstanding role that the TVET and the education system have to play for support. The *Roadmap* places the

TVET fully integrated into the value added chain of the economy and reflects on gaps in the system that urgently need changes. These include:

- The fragmented organizational structure of TVET;
- The poor and sub-standard quality of the output of technical institutions;
- Absence of reliable data for planning and decision-making of training for technicians and craftsmen;
- Lack of demand driven and standardized curricula;
- Curricula, teaching methods, examination and evaluation practices that do not focus on current knowledge and practical aspects;
- The trainers' development for various levels of technical education that has not been systematically planned and upgraded;
- The arrangement of training and refresher courses for teachers and trainers in areas of new and breakthrough technologies[#].

From this point of view the *Roadmap* is fully in line with the emerging trends of the economy and society. The following are often mentioned to profile the TVET personnel competence and qualification level:

- The knowledge society and knowledge economy as challenges for teachers in TVET;
- Demands for lifelong learning for both teachers and trainees;
- Decent work, modern working attitudes, social key-qualifications like environment protection;
- The fast-growing processing industry, automation and demands on qualified workforce for maintenance and repair work;
- The parallel industry of traditional handicrafts as backbone of the economy; also considering the up to 80% companies at SME level with a huge demand on qualified staff for better products and service;
- Energy efficiency, protecting resources of raw-materials and renewable energies;
- Tendencies for the growing service sector and infrastructure with new employment fields;
- The special challenges of the IT-sector;
- The tendency for self-employment and training demands for "start-ups" and incubators;
- The development in the fields of agriculture including agricultural machinery;
- Influence of the global economy with increasing economic and technical competition resulting in a more and more globalized demand on the qualification of workforce.

3. Salient HRD features in the *National Skills Strategy*

In line with the Government's high priority on skills, the *National Skills Strategy (NSS) 2009-2013* has set overarching goals which are focused to achieve two main paradigm shifts:

- The shift from time-bound, curriculum based training to flexible, competency-based training;

- The shift from supply-led training to demand-driven skills development by promoting the role of industry in both the design and delivery of TVET.

The three main objectives to receive the goals are:

1. Providing relevant Skills for Industrial and Economic Development;
2. Improving Access, Equity and Employability;
3. Assuring Quality;

The action plans and the roles and responsibilities for the objectives make it clear that the policy of the NSS is oriented towards keeping successful traditions alive but to upgrade it under the new economic and social conditions of the society. One example for it is the apprenticeship training that shall be better adapted to the demands of the industry by using the competency-based training (CBT) pattern among other measures. But the NSS is also strongly focused on completely new approaches like the more flexible delivery of training by part-time and evening courses, the increasing role and participation of the private sector, career guidance and placement services, the encouraging of the entrepreneurship and the integration of the informal economy workers into the TVET system.

Under **objective (1)** CBT shall in particular support a more workplace-required competence and the employers will be invited to determine such competences themselves. Industry Specific Centres of Excellence (ISCE) are going to be established in greater numbers across the country. ISCEs shall ensure that the training schemes correspond more with the diversity of the actual economic activity. Disseminating best practices by the teachers and action as resource centre are strong aspects of the more advanced ISCE. It will also collaborate with other institutes of the sector and with staff training institutes for the professional development of the staff and the provision of Master Trainers.

Objective (2) is directed to expand the geographical provision of training and to overcome inadequate geographical availability of facilities. Skills for women and training for disadvantaged groups are in the focus including the informal economy workers. But also the mobility of skilled workers shall be enhanced by TVET. By reason of this broad approach for access and employability, the provision of career guidance and placement services are an integrated part of objective (2). The enhancement of the status of skills training is the most ambitious output and shall be reached with successful training campaigns, awareness-raising media work, skills and innovation competitions and other measures. NAVTTC (formerly NAVTEC) has already held one national skills competition and will also consider establishing Awards for skilled workers. Training for strengthening employability of the workforce will become one challenge for the training of teachers.

Assuring Quality under **objective (3)** is also composed of actions with a high political relevance. **Streamlining policymaking** will reduce overlapping responsibilities, mandates and strategies of different institutions which are doing the same thing for the same target group. The alignment and synergies across the work of federal ministries and provincial departments will be consequently linked to the endorsement and implementation of the NSS.

The **National Qualification Framework** (NQF) under objective (3) is focusing on better pathways from school to TVET and higher education, and will promote credit transfer between the qualification levels and will structure existing and new qualifications that will strongly impact the education system and TVET as a whole. Additionally, it would be an important step if the teachers' qualification levels and career pathways are integrated into the NQF[#]. The **Accreditation of Training Institutes** and **Reform of the Management** will follow international standards. The Asia Pacific Accreditation and Certification Council had been chosen as one of the agencies and it has accredited one institution in Islamabad. But assuring quality as a target of the NSS is also connected to the enhancement of the **Training Instructors** (see chapter 1) and **Undertaking Research**. Targeted research work in particular will feed the policy goal for higher levels of teachers' pre-service training.

It goes without saying that all these actions of change, reflected in the NSS above, are linked to the development of human resources in TVET. It is focusing the teachers' awareness on changing demands in modern trades of TVET and it highlights the challenge to be prepared for through new training philosophies like the CBT and demand-driven skills development for a prospering economy. Being prepared to teach for the employability of the next generation of the workforce is as important as the readiness for lifelong learning for both the workforce and the teachers themselves. The policy for teaching personnel has to ensure the readying of teachers to meet new challenges. It also has to promote the competence and attitudes of teachers to work as resource persons in the TVET network of the country.

4. Brief on the National Qualification System for Teachers (NQST), 2007

An initiative of NAVTEC for the teachers training was the National Qualification System for Teachers (NQST) that had been presented on July 25, 2007. It was developed by a working group consisting of representatives from Balochistan, NWFP and Sindh that was led by TEVTA Punjab. The ensuing consultative process involved a variety of high-ranking expert groups at both the federal and provincial level.

The main recommendations of the NQST include:

- the concept of a higher level of mandatory pre-service training for teachers;
- compulsory professional development tied to promotions and career planning;
- allocation of seats for the new generation of teachers in Engineering Universities and opportunities to receive the graduation as M.Sc. and Ph.D.;
- a rigorous performance evaluation system;
- a change of the salary structure.

It is not known for which reasons the NQST had not yet been put into practice. But its visions and recommendations are in accordance with the drafted HRD policy paper and can be seen as a late, but not too late, confirmation. The expertise of the members of the former working groups could deliver suitable inputs for the ongoing work (see chapter 9).

5. Main features of proposed pre-service and in-service training for teachers

The personnel in TVET are composed of a variety of occupational profiles with related qualifications. Field visits and interviews could define 10 different groups for teaching, management, guidance and other activities (see Annex 1). The HRD would extend to more specialized groups if the human resource and training managers from bigger companies, related staff in the Chambers of Commerce and Industry, professionals of labour offices, headhunters and other stakeholders were considered as well.

The policy for human resources development (HRD) in the TVET sector of Pakistan concentrates on the teaching personnel, which is the largest group numerically and in terms of qualifications. The teaching staff is further divided into teachers and instructors[#]. Due to the traditional TVET patterns - with apprenticeship training, full time training at vocational institutes and a great variety of company-based and specialized short-term training – it is a continuing practice that the qualification of the teaching staff (or teachers) starts from G-I and G-II levels for the more practical oriented trades/competencies. For trades requiring higher levels of qualification there are the Bachelors in various Engineering disciplines. However a large group of teachers is working with the qualification level of the Diploma for Associated Engineers (DAE).

There is no political reason to change the qualification composition completely. The main focus of the NSS is the quantitative increase in the groups of teachers and their qualitative upgrading. The HRD policy envisages a bigger share of engineers and the technical and pedagogical upgrading of all TVET staff. The following features of the HRD will therefore need political attention in general:

5.1 The general profile of the teachers in TEVT

The HRD policy will distinguish and support the training of the following individual occupation profiles:

- The teacher for imparting the theory of the trades in the related field (e.g. theory for all trades in the fields of Metal/Mechanic);
- The profile of an instructor, whether he is teaching both the theory of the trade and the practical skills, or is teaching the trade practice in school-workshops;
- The supervisor of the company which is a partner for apprenticeship training; his/her qualification can be GI and GII, DAE or Bachelors;
- The teacher who continues his academic career up to lecturer level at university for teaching teachers and for research and development work.

Some countries rely on the instructor as the only teaching staff. The policy of TVET in Pakistan will focus on both groups, e.g. teachers and instructors for trades of different qualification levels and for a different volume of content. In many traditional trades, like blacksmiths and welding, instructors only will be employed to teach both theory and practice. But it depends on the number of trades and school organization, if one teacher imparts the theory of the trades (see chapter 5.4) while the instructor conveys the practical skills. In High Tech trades a similar division of labour in teaching will become the practice. While CNC training needs a highly qualified instructor for programming, commercial trades may require only one teacher.

A vibrant agenda for the last group of teachers with high academic profile does not exist for the TVET in Pakistan. The experience of these teachers is an important ingredient for research and development, for the delineation of didactic methodology, production of teaching material, etc. Also lecturers for a higher scientific level in pedagogy are in the minority. The NQST has already observed that TVET managers should have a university qualification in the field as well. For all the above mentioned groups it will be ensured that the occupational competence is composed of four basic elements:

- technical competence (see 5.4)
- psychological and pedagogical competence (see 5.3)
- social and human competence
- academic competence.

The level and volume of the competencies for each group of teachers will have common subjects on the one hand; on the other, the subjects would be diversified depending on the trade field and the levels they are working in.

5.2 The academic and technical level of the teachers

This draft policy paper is recommending diversified academic and technical levels in view of the multiple training paths in the TVET system and the demands of the economy. The proposals which could be implemented include the following:

- The Master of Technical Education (MTE), provided initially at selected universities for prioritised trades only,
- The Bachelor of Technical Education (BTE), with a postgraduate pedagogical study either at universities and/or at the STIs in the provinces,
- The teachers at DAE and GI –GII levels, combined with a pedagogical in-service training at the STIs,
- The supervisors for training in-house apprentices at private sector companies. The supervisors could be recruited from GI, GII, DAE or the Bachelor levels (depending on the profile of the company) and should receive training for a pedagogical minimum at STIs.

The policy proposes motivating DAE graduates to continue their studies up to the Bachelor level and to start working in the TVET sector. Special consideration is also accorded to graduates from secondary school. Salary regulations of TVET and career planning have to be adapted for that purpose (see chapter 7).

5.3 The education philosophy for teaching teachers

The policy for teachers' training will use an international model of an action-oriented training scheme. Its pedagogical tradition is an old one and states: "Doing things is much better education than reading about it only". In modern times the action-orientation for teachers includes methods like problem based learning (PBL), early lecturing under

school conditions and a very close relationship with the working reality of companies. The use of IT instruments -- like e-learning and the internet-sources -- is part of it.

The competence for teaching and educating includes:

- All teaching elements (planning, organization, teaching methods, educating, diagnosing, assessing, imparting social attitudes etc.);
- Psychological knowledge and skills to teach the youth and adults;
- Knowledge of TVET systems of their own country and international models;
- Knowledge about trades and the development of trades;
- Knowledge about the working process in companies and the technology used/required;
- Didactic competence to transfer technical knowledge and skills to the lower level of skilled workers and craftsmen.

The pedagogical qualification and competence has to be diversified. It needs a different approach for the supervisor of the company who is specialized for furniture production and a Bachelor for IT who teaches service for hardware and has to impart a wide spectrum of technological knowledge and skills.

5.4 The composition of the technical profile of teachers

Technical competence has to be paid particular attention because it forms the teaching profile of the groups of teachers and it is a strong element of the structure of the institutional faculty. Thus:

- the levels of technical competence will vary from GI and GII levels, via DAE level up to the Bachelors (BTech and BScEng).
- the policy in principle states that the combination DAE and BTech / BScEng should be a suitable technical platform and competence for teaching most of the trades in TVET;
- the decision about the technical profile has to consider the structure of trades taught and the organization of the school curriculum, because the teaching process may need the division of labour of teachers, instructors and supervisors of the companies (to ensure an advanced level of practical skills, see Annex 1).

Different compositions cannot be derived from reading literature only, nor from questionnaires answered by the teachers themselves. Accurate assessment needs a deeper understanding of market viewpoints and the analysis of teachers' "occupation market" are essential. These tasks, and those that follow, will be carried out by the Core Group (see chapter 9):

- Analyzing the technical subjects from the curricula of all trades of an economic field like Mechanics and Electrical. Usually one teacher has to impart knowledge and skills for 3-5 and even more different trades of each economic field which are part of the National Qualification Frame (NQF);
- Analyzing and assessing the technological situation and working processes of modern companies in order to deliver a more accurate view about the level of work for TVET graduates;

- Defining the scientific level of the technical profile (e.g. learning the theory of electro-technique, profound practical knowledge of electricity, operating programmed equipment like PLC);
- Defining the level of practical skills related to the trades for which the teachers are working. This is a critical issue due to the expected know-how. Should the teacher be capable of installing an automatic production line or shall this be the competence of the supervisor of the company? Similar questions have to be answered for other trade groups as well.
- The previous competence is also linked to legal regulations and acts of trades, for instance the permission to work with generators, transformers and electric transmission nets.

6. Recommendations of a four model approach for the preparation of TVET teachers for the future

6.1 The dominating in-service training for teachers

A genuine pre-service system for teachers – which means a comprehensive technical and pedagogical study has to be passed before applying for a job as a teacher – does not exist in Pakistan. This kind of pre-service training is only available for teachers in Mathematics, Natural Sciences, Languages and other general subjects in TVET. Those teachers are trained at universities for teaching at secondary school level. The teachers for TVET are instead educated by an in-service training system after the employment contract is agreed upon.

After that they are subjected to a procedure of staff selection. Technical and pedagogical training lasting up to 12 months follows. During employment, compulsory further training for both technical and pedagogical subjects is participated in periodically. And both – the initial in-service training and the further training – are closely linked to the placement in the salary system of TVET.

The present policy paper recommends the continuation of the current approach. But then the social and human competence of teachers and other main competencies (technical, academic, psychological and pedagogical) mentioned in chapter 5.1, have to be considered. These aspects may be analyzed by the proposed Core Group if a pre-service model is to be established for the future. Experience in other countries demonstrates that applicants are more motivated in the teaching profession if they decide to pursue this career from the beginning, rather than as a last resort.

In-service training is the general model for further training and it will continue as one instrument to keep the philosophy of life-long learning alive. In general it needs an upgrading of subjects and procedures (see chapter 6.2.1). In order to put the goals of the NSS into practice, in particular by a more market-oriented TVET, the development of the following four teacher training models will be placed on the political agenda of the TVET system for the future.

6.2 The training models for the future

6.2.1 Strengthening the in-service system

The review of procedures, strengthening and enlargement of in-service training are imperative for meeting the fast-growing demand for teachers for reaching the goals of the NSS. The quantitative demand for teachers will increase immediately if the TVET system enlarges its capacity to accommodate 950,000 students by 2013. For this, an estimated 32,000 more teachers would be needed. These figures may be on the lower side if a demand analysis is conducted in light of the rising population. The demographic data indicates that in the 15-year-old age group (boys and girls), there are about 3.5 million persons annually at present. This is the age for application to the TVET institutions and the general secondary schools.

The in-service training will continue offering both training in pedagogy for teaching in TVET and upgrading for technical qualification. The performance of in-service training in general is at a good level but it needs new blood supported by international know-how. The present programmes of the staff training institutes (STI) for pedagogical knowledge and skills will be up-graded by the output of the teacher training measures -- that have been initiated in May 2012 for up to 10,000 employed teachers -- for instance in:

- Instructional planning (including all components)
- Teaching methods for classrooms, labs and workshops
- Assessment of learning

The courses will provide knowledge about action-oriented training, problem-solving methods, concepts of blended learning and other modern teaching methods. The STI shall be invited -- after finishing the course for the first 20 multipliers -- to adapt their programmes to the new subjects at the international level.

The second important part of up-grading in-service training is technical didactic. Technical didactic in brief is the content, method, organization and evaluation of teaching technical subjects. This has to be done trade by trade and it can only be done by using the experience of the advanced vocational training institutes (VTI), apprenticeship training centres (ATC) and the staff training institutes (STI). Also the centres under the National Training Board (NTB) have to support the measure. Visits and observations proved that advanced experience is available in many of the institutions but it needs to be shared and disseminated during in-service courses. The NTB will be obliged to prepare a two-year programme by inviting competent experts from VTI, ATC and STI. "Methodical Commissions of Trades" shall be instituted as a sub-organization, distributed among the invited advanced institutes and centres.

The third part is the up-grading for technical competence. For that, VTIs, STIs and universities can be used. Each provides various levels of qualifications which need to be strengthened. It is well known that STIs are cooperating with VTIs and companies for selected specializations. This existing cooperation has to be reinforced by more organized workshops to exchange experience and by "open days" for teachers to learn from each other. The national trade competition was a very fine instrument for soft competition and exchange among the training institutions. It should be immediately reactivated. Still open to question is the participation of companies. It is known that Bachelors in particular lack workplace experience. Basic workplace knowledge and practical skills for them shall be provided by advance VTIs. In addition the NTB and the NAVTTC may arrange with the Chambers of Commerce and Industry for companies to offer free internships on demand.

A fourth subject of special interest is pedagogical psychology. It should be part of teachers' training. The Core Group will initiate an analysis at advance STIs and with support of universities that educate secondary school teachers, to form a programme during the current year.

The upgrading of in-service training will also take into consideration the different education background of the target groups. It has to become one input for the programme planning at STIs.

- The DAE graduates are the biggest group. New teachers will have to pass a 6-month pedagogical training at the staff training institutes (STIs) of the provinces including practical pedagogical sessions. The question regarding whether this shall happen before they are permitted to start as a teacher will be answered by the Core Group (see chapter 9). It is recommended that the 6-month training be accompanied by an experienced tutor. Regarding the technical competence of the DAE graduates, they should have the needed knowledge and in particular the practical skills in the related trade. Sometimes it is observed that DAE graduates have too many gaps in practical skills. But erasing such gaps cannot be the role of further training. These gaps have to be addressed during the initial training. It is therefore a great challenge for, and responsibility of, the VTIs to prepare them for the "teacher's job". The continuing up-grading of the technical competence with new materials, tools and working procedures has to be arranged in collaboration with VTIs, ATCs and STIs, as mentioned before. Companies should also be involved to receive teachers on visits to up-grade their knowledge about the various aspects of the market place.
- The second target group is that of graduate engineers. They also have to pass a similar 6-month pedagogical training but it has to be arranged with different content. The engineers have to learn in particular the modern didactic and especially the technical didactic including the "principle of didactic reduction". Here they learn how to adapt their higher level knowledge and skills to the level of skilled workers and craftsmen. The NSS has announced the goal that more engineers shall be employed in the TVET sectkr. If the pilot-project for post-graduate study (see chapter 6.2.2) is successfully tested, then the engineers may use in-service training for further training only.
- The third group comprises teachers with the qualifications for GI and GII levels. They should continue with the shorter in-service training of up to 3 months especially directed to workshop teaching.

6.2.2 Developing and implementing a postgraduate study for Bachelors of Technical Education (BTE)

Modern technologies and related economic demands on the qualification of the employees will strongly influence the whole TVET sector as reported in chapters 2 and 3. These were the main reasons to adapt the HRD policy to the employment of a larger number of engineers (BTech and BScEng) as teachers. It will happen in the first step for

the so-called High Tech trades. But it seems to be a matter of time before similar demands are made for other economic sectors including agriculture, tourism etc.

The postgraduate training scheme for the teachers is expected to attract in particular former DAE graduates who continue studying for the BTech to start working as teachers in TVET.

As an exception one shall also consider the graduates from the secondary school (12 grade) who continued to BScEng. All experience expressed by the interviewees shows that they would have to fill more gaps in the technical and practical vocational competence due to the missing TVET training before they start studying. But if they are willing to join, the orientation should be to fill the gaps by special courses.

The postgraduate study will be composed of 6 months training in pedagogy and psychology for TVET, containing the subjects of modern teaching and performance of practical school lessons. The study should be accompanied by a tutor for the school practice and finalized by passing an exam. After the certification as Bachelor for Technical Education (BTE), the graduate can apply for a job. The 6-month course should be offered at the beginning at advance and licensed STIs. In the future universities should integrate the postgraduate courses as a full-time BTE. Otherwise the complete study for BTE and Masters (MTE, see 6.2.3) would claim up to 10 years of study. This seems too long a duration for teachers in TVET (see Annex 2). If the universities integrate the 6-month pedagogy course, then the STIs could be kept free for continuing training.

TEVTA Punjab suggested devising a 12-month postgraduate study including 6 months for upgrading technical competence. This we consider to be too long a period. The dynamic is that the education path of these teachers should deliver adequate and competent technical know-how for TVET. It is first of all the responsibility of the initial training. For the 12 grade/BScEng applicants the VTIs and STIs should offer a 6-month technical training but concentrate on practical skills and related teaching methods.

The above mentioned postgraduate study can only proceed successfully if the salary regulations for teachers are adapted to a level that is comparable to the private sector of the economy. (See chapters 7 and 8).

6.2.3 The Masters in Technical Education (MTE)

Technical Cooperation with several countries and latest studies have shown that abroad, TVET is accepted and developed as a field of science[#]. This is not simply pedagogic. It is one special field that is closely linked to the education system is well integrated into the economy. It has its own system encompassing standards for training, the best curricula, modern teaching methods and materials, etc. Pakistan is missing a professional group of teachers qualified for research and development. After more than 50 years of Technical Cooperation and hundreds of teachers who passed further training courses in Pakistan and abroad, the country still relies on external support to up-date its training standards, teaching methods and other instruments of TVET.

Cognizant of the above, the Government has decided to start the new degree programme of the Master's of Technical Education (MTE) at a university. DAE/BTech/BScEng.graduates and the 12-grade graduates who passed BScEng. successfully and who have the postgraduate certificate as BTE or who studied BTE full-time may apply for the Master's programme.

It is a 12-month-long course in (vocational) pedagogy, psychology and technical didactic including research work, developing projects in TVET, etc. The training for technical competence could be limited to lab/workshop exercises, but it would even then concentrate on didactic projects. Such projects, for example the development of teaching material for trades of Metal/Mechanic, will be part of the national research and development programme for TVET that is launched by NAVTTC annually. The precondition for that Master study concept is again a high level of technical theory and practice of the Bachelor studies. The Master study could be provided by public and private universities. It will be tested as a "pilot course" at the Punjab University, Lahore and the University of Sindh for trade groups in the fields of Information Technology and Agriculture.

One Masters Study for Technology Education is still offered at the Punjab University, Lahore. Its target groups are technologists, production planners, experts of marketing, managers for human resources of companies and other occupations in the economy. Therefore the study is based on a broader approach to technology. Technical competence as well as pedagogical competence is not really focused on. The programme for the Master's of Technical Education would need a new set-up.

6.2.4 The Supervisors for Apprenticeship Training

The NSS stipulates a comprehensive review of the *Apprenticeship Ordinance* to involve companies with less than 50 employees. In this way apprenticeship training is extended to a larger number of small and medium sized enterprises (SME). This will contribute to the national economy as well as help enlarge the TVET training capacities. The SME will benefit from supervisors who work to produce better qualified employees. The intention is to widen apprenticeship training including some measures to strengthen the quality of training on both sides, the school and the company. One measure will be instituting an approval procedure for permission for, and certification of, the training imparted by each company. For that permission the company has to ensure suitable products, tools and working procedures for training. Labour safety standards have to be fulfilled and environment protection standards observed. The Chambers of Commerce and Industry can be pivotal in developing such a procedure.

The second main pre-condition for the training permission is the availability of qualified supervisors for teaching and educating the trainees. Supervisors are usually highly qualified skilled workers and craftsmen of the related trade, who have a good technical reputation as well as social authority. The special support for these "teaching staff" – that is the second strong partner of the apprenticeship scheme – should be basic pedagogical and didactic knowledge. It is sometimes called "the pedagogical minimum" but is an important instrument for training on the spot and also for cooperation between school and company. Subjects of the "minimum" are methods of training, basic didactic principles, how to assess training results, the motivation of the trainee, how to write

training reports and others. Such a basic course will be developed and provided by the STI and it could also be produced as a written document as a handout for the supervisors.

7. The practice of teacher and instructor recruitment in Pakistan at present, its obstacles and how to adapt it for the HRD policy

Varying recruitment procedures and salary structures exist at present for the TVET sector in the country. Rigorous procedures and standardized structures are available for numerous Government services. But the TVET sector has not benefited from these models. For example the Federal Public Service Commission (FPSC) has set procedures for recruitment for the various Federal Government Ministries and Divisions, or the Civil Services of Pakistan. Similarly in the Provinces, there are the Provincial Public Service Commissions (PPSCs) which recruit for some of the Provincial Civil Services. Their recruitment process includes a range of pre-service qualification procedures and a thorough and protracted in-service training.

The FPSC requires a written examination in 'Compulsory' and 'Optional' subjects. On the basis of this the short-listed candidates are interviewed. The candidates are then subjected to psychological and physical tests. Once recruited they undergo rigorous in-service training consisting of 'Common' training for all recruits, no matter what Service they may join. Then a written test is set. Those who qualify are assessed for, and assigned to, various Service Groups, i.e. District Management Group (DMG), Pakistan Foreign Service (PFS) etc. This is followed by 'Specialised training' for a particular 'Group' or 'Civil Service'. Another written examination takes place before the public servant is given a posting. Furthermore, during Service promotions are tied to the passing of mandatory courses at certain levels. Neither is such rigour adopted nor is such care taken in the case of teachers and trainers of TVET.

7.1 Current Procedures

The recruitment for TVET sector is not nationally standardized. In fact several Provincial services share the same lack of well-defined structures.[#] In the TVET sector the systems vary not only from Federal to Provincial Government institutions, Province to Province but also within the Province where training institutions from different Departments have been brought together under TEVTAs or other TVET authorities.

In the Punjab province training institutions of seven Departments have come together under the umbrella of the Punjab TEVTA. There the teachers/instructors are still subject to the procedures, rules and regulations of their original Departments. A similar situation exists in Sindh and Azad Jammu and Kashmir (AJK).

The matter is further complicated by the fact that three types of personnel constitute TEVTAs. (See figure below). One group consists of the regular Government servants who come to TEVTAs on deputation. They serve for short

periods and then return to their parent Services, whether Provincial or Federal. The second group is that of the permanent employees of the training institutes which originally belonged to different provincial Departments. This is the largest group with well-entrenched stakes and interests. They tend to prefer the status quo. The last group consists of Contract employees.

In Punjab there is an additional provision under Clause 7 (j) of the *TEVTA Employees Service Regulations, 2011* for appointments 'on ad hoc basis for a period not exceeding six months.'

NAVTTC/Provincial TEVTAs Personnel

Government Servants Employees (Temporary)	NAVTTC/TEVTA Employees (Permanent)	Contract (Temporary)
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The present methodology for fresh recruitment for TVET is neither rigorous nor enunciated in a manner conducive to selecting those most suited to teach and train at the relevant levels. An advertisement in the press is placed. The applications received are processed in the light of the demands specified in the advertisement. A written test may or may not take place followed by the interview of candidates. On the basis of this the recruitment of teachers/trainers is finalized.

Clause 8 (1) of the recently notified Service Rules called the *Sindh Technical Education and Vocational Training Authorities Employees (Appointment, Promotion and Transfer) Rules 2012*, states:

Initial appointment to a post shall be made on the recommendations of the Selection Committee on the basis of interview or test to be held by the Selection Committee after the vacancies have been advertised in newspapers.

Clause 7 a) of the Punjab *TEVTA Employees Service Regulations, 2011* states:
All recruitments will be merit based as per recruitment criteria.

Clause 7 b) of the same *Regulations* states:

All appointments in TEVTA will be made through advertisement in the press.

Details for recruitment specify similar process for 'TEVTA Head Office, Field Offices and Institutions' (*Punjab TEVTA Employees Service Regulations, 2011*, Clause 11) based on the Basic Pay Scales (BPS) system. It includes teachers and instructors. The three criteria considered for initial selection/recruitment (Clause 13 A) are:

- i. Educational Qualification
- ii. Experience in the Relevant Field and
- iii. Interview.

In the recruitment for some Field Formation/ Institutions in Pay Scale (PS) 11 and above the additional qualification of 'Computer Literacy' (actually 'a three months

certificate for computer applications') is stipulated. Similarly an optional provision is made for an 'aptitude test' (page 16 of Punjab *TEVTA Employees Service Regulations, 2011*).

Therefore the largest Province, in effect, recruits not on the basis of any written capability or practical demonstration of teaching competence.

A not dissimilar situation persists in other provinces with a less developed network of TVET institutions. However in no Province is a practical test for the fresh recruits set in the discipline/skill/trade for which the person is being recruited. It is accepted by all provinces that the Pre-service diploma/degree is sufficient for teaching/training.

7.2 Salary Packages

Concurrent to the different recruitment processes, the ensuing salaries vary. Some of the employees working in NAVTTC, TEVTAs are regular Government employees recruited through the FPSC or PPSCs. They are given the salaries according to the national grades known as Basic Pay Scales (BPS) and other perks, (deputation allowances, bonuses etc.) Others are NAVTTC or TEVTA employees and these include the vast number of personnel in the training institutions such as STIs, VTIs GTCs etc. They are also given pays according to BPS but often lack the 'perks and allowances' of the regular Government Servants even if they perform the same work/job. Then there are Contract employees who have fixed service duration and salaries for performing the same, or similar, work as the other employees.

7.3 Proposals

In view of the above, the TVET sector has registered and continues to register a mixed trend in personnel and their capacity to deliver. The TVET sector is considered the 'last option' by students and teachers. This has spawned frustration and lack of motivational drive among the majority of teachers and trainers. As such the following recommendations are proposed:

- Specification of Qualification Levels. Since teaching/training at TVET institutions is carried out for various levels, it is imperative that the professional qualifications and skill competence required of the teacher/trainers for each level is stated with clarity. This basic requirement will then help define the 'outcome', i.e. what is expected to be imparted to the trainees/students.
- Standardization of Recruitment Procedure. This may be brought in line with other Provincial and Federal Government Services, to ensure uniformity and higher quality of intake. As such written and practical tests shall be instituted to ascertain the professional skill level of the fresh candidate.
- Rationalised Salary Package. The uneven salary structures may be addressed and initially brought at par with regular Government grades. Then additional professional allowance should be budgeted (as existing for other professions). The disparity among various streams of TVET personnel (Government employees, TEVTA employees and Contract employees) may be rationalized in the interest of institutional harmony and performance-based remuneration.

- Clear Tasks and Targets. For all trainers/teachers these should be specified, discussed with them individually and their commitment finalized in writing. Against these bench-marks periodic assessment is carried out to ascertain the performance/ achievement of each. These results are shared with them. This simple procedure will ensure raising standards, commitment as well as transparency.
- Introduction of Performance-based Incentive System (bonuses/recognition etc). This ‘tied method’ in practice abroad has proven to be most effective in improving the quality of training delivery.
- Systematic Career Path/ Professional Development. Clarity in path/s that a teacher can take ensures a sense of purpose and prompts the urge to excel in his personal and comparative performance. As such a system of life-long learning through long and short courses as well as recognizing achieved performance should be institutionalized for the teachers/trainers.
- Mandatory In-service Periodic Training Linked to Promotion. Currently promotions in Sindh are made ‘on the basis of seniority-cum-fitness’ {*Sindh TEVTA Employees (Appointment, Promotion and Transfer) Rules 2012*, Clause 13 (2)}. Fitness here is measured on the basis of the Annual Confidential Reports (ACRs) which give only a general assessment.

In Punjab, the *TEVTA Employees Service Regulations, 2011* are more detailed. Clause 9 d, states that promotions would be made ‘on the basis of the employee’s annual appraisal, performance, achievement of goals, general conduct, communication skills, peers (*sic*) relationship, team work, academic and professional qualifications / experience’.

However the instruments to measure all these factors are inadequate. The ACR form normally has sections for ‘achievement of goals, general conduct, communication skills, peers (*sic*) relationship, team work, academic and professional qualifications / experience’. But these sections are of a general nature and a system of more accurate quantification of these factors is not provided for.

In the civil and military services, in-service training is a mandatory requirement, at several levels, for promotions. If some mandatory training appropriate to their specific position and tasks at specified levels is introduced in the TVET sector, it will ensure a more objective promotion as well as cater for up-gradation of skills and sensitization to new trades and emerging technologies.

- Development of Training Institution linked to Promotion. An in-house methodology for continuing up-gradation of institutions is to involve the staff in the process. This would include drawing up plans for the development of curriculum for new skills, promoting Public Private Partnerships, creating linkages with industries and the Service sector businesses and similar objective-oriented activities. TEVTAs or institutions themselves may establish units to monitor the involvement of each member of the staff and assess the performance for his/her promotion.

8. Estimated cost of the adapted pre-service system

As highlighted in Chapter 6, there is no standardized pre-service system for teachers in the TVET sector in Pakistan. While there is some pre-service training available for teachers in general subjects like Mathematics, General Science etc., this kind of training in technical and pedagogical disciplines is missing. Candidates for TVET teaching/training positions also do not have to pass any comprehensive set of examinations as prescribed for other Federal and Provincial services, (see chapter 7).

As envisaged in the NSS, the TVET system has to be expanded to cater to 950,000 students by 2013. For this it is estimated that 32,000 teachers would be required. As such the TVET sector should have a pre-service programme that decreases the burden of in-service training which invariably has a huge implication for the public exchequer. Pre-service training by its nature is paid for by the candidate. Even where subsidies exist the candidate has to bear part of the training costs. In this way the potential teacher/trainer would come equipped with pedagogical skills and technical competencies that at present are partially being imparted during the in-service training period.

Pre-service upgrading courses can be conducted at VTIs and STIs, depending on the level of teachers required and the skills or trades in which recruitment is desired. One option is to recruit DAE graduates and subject them to 6-month pedagogical training, (see 6.2.1). Alternatively this 6-month training may be made mandatory pre-service requirement for all DAE graduates who wish to take teaching assignments. The same condition may be made applicable to BTech graduates and graduate engineers (BScEng); so that their higher level knowledge is honed to address the levels they will be teaching.

Keeping in view the recommendations proposed in chapter 7, stakeholders were consulted to ascertain the rough cost estimates for pre-service training for potential teachers and trainers in the TVET sector. These vary on the basis of time-span, the type of skill as well as the level or category of skill. As is apparent the training cost of a trainer for GI and GII levels of technical competence would not be the same as that required to impart pre-service training to DAEs, BTechs and BScs.

The paper on HRD Policy has proposed the formation of a Core Group in charge of heading and coordinating the implementation in collaboration with the TVET Reform Support Programme. The composition and tentative activities of the Core Group are reflected in Chapter 9. The Core Group will address the pre-service training system issues. It will ascertain the prioritized trades in which teachers/trainers are required in the short, medium and long term and bring in the federal and provincial government projections. Also the demands of private sector companies shall be taken into consideration. On the basis of this data, the cost of the pre-service courses can be more accurately determined.

However to provide a rough estimate of the cost of selected regular courses and courses being conducted for in-service personnel, data was obtained from the Department of Technology Education, University of the Punjab, Lahore. It is tabulated below. These costs can be rationalized by the Core Group for various level courses for pre-service training to be conducted at compatible TVET institutions.

('PGD' stands for 'Post Graduate Diploma' as envisaged by TEVTA Punjab).

The affairs of teachers training for both pre-service and in-service in general are sovereign tasks of the state. All public sector institutions for TVET, whether Staff Training Institutes (STIs), Government Technical Colleges (GTCs), Government Technical Training Institutes (GTTIs) or Vocational Training Centres (VTCs) provide training and teaching at substantially subsidized rates. Even the courses conducted by the Department of Technology Education, University of the Punjab, Lahore are subsidized.

But pre-service training and in-service training should also be open to the private sector in order to expand capacities and for establishing a closer link to market demands. Provincial TEVTAs and TVET institutions shall engage with the private sector to develop links with research cells and industries for skills. This would facilitate greater exchange of Market Information, would support the up-gradation of curricula and the identification of, and pre-service preparation for, emerging professions and skills.

9. Conclusions for the implementation of the four model approach

It goes without saying that the institution of the State in charge of TVET is the one that is mandated to head the development of the teachers for the future. This is the NAVTTC on behalf of the Ministry of Education and Training. But the preparation of teachers for TVET is a stakeholder related issue at the same time because it is influencing the TVET level and quality for both public and private providers. Furthermore, it is impacting the level of market related TVET skills and is affecting the status and acceptance of an important group of professionals in the society. For these reasons NAVTTC should invite a variety of stakeholders to participate in both the decision-making and the implementation. The main institutions that should be involved are the following:

- The Ministry of Education and Trainings (MET)
- The National Vocational and Technical Training Commission (NAVTTC)
- The National Training Board (NTB)
- The Higher Education Commission (HEC)
- Academy of Educational Planning and Management (AEPAM)
- The National Institute for Science and Technology (NISTE)
- Technical Education and Vocational Training Authority (TEVTA) of Province(s)
- Vocational Training Institute (VTI) that trains DAE graduates
- Apprenticeship Training Center (ATC)
- Technical/Engineering University
- Staff Training Institute (STI) in Province
- Private Sector Company
- Federation of Chambers of Commerce and Industry
- Association of Teachers in TVET from the Islamabad Capital Territory
- Pakistan Engineer Council (PEC).

Secondly, the constitution of a Core Group is recommended. This is proposed in view of the variety of important changes in the previous preparation concept such as establishing teacher training up to the university level, adapting remuneration related rules and regulations and regulating the employment procedure. One nominee from each participating institution will be a member of the Core Group. The Chair of the Core Group will be elected in the first meeting. One institution should be motivated to provide the administrative staff.

As most of the TVET institutions are involved, more or less, in an existing and professionally working in-service system for teachers, it is not necessary to divide the Core Group into pre-service training and in-service training sub-groups. The newly recommended pre-service training shall be based on the experience of the institutions providing in-service training, so that the previous gaps are appropriately eliminated. The pre-service training is a genuine need and must be linked to, or combined with, in-service elements as reported above.

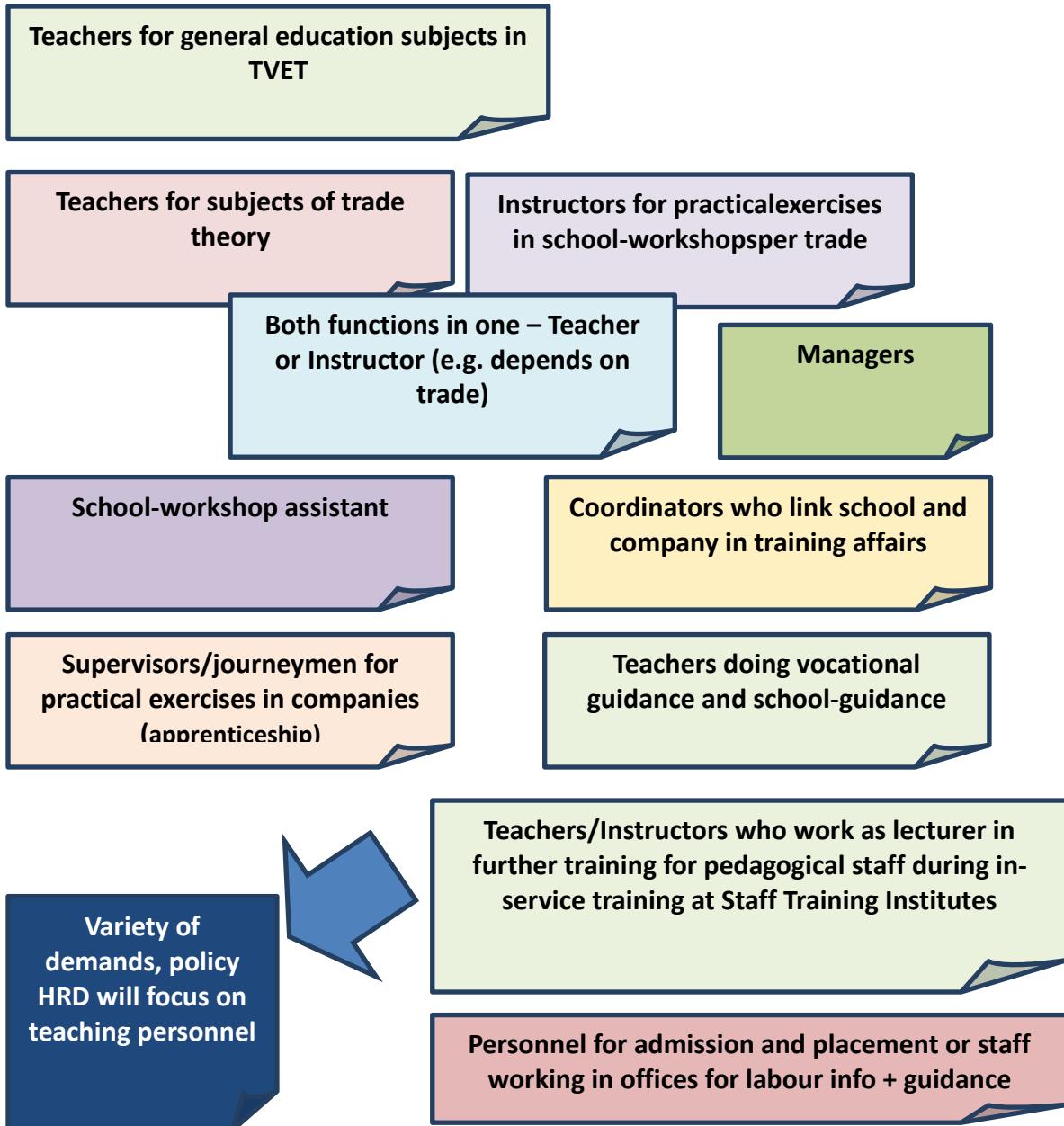
Thirdly, instead of dividing the Core Group, it is recommended to establish groups of specialists for selected issues through invitations to additional institutions or organizations. This can be done, for instance, for

- the Methodological Commissions (see chapter 6.2.1);
- the team of STIs for developing the 6-month programme in pedagogy;
- the team of the universities that designs the postgraduate study or pre-service study programme for Bachelors;
- the team of universities that designs the Master's study programme;
- the team of ATCs and STIs that will compose the pedagogy programme for the supervisors and the rules and regulations to permit companies to impart such training;
- the team for developing the regulations about the salary structure and career planning.

Experts who were involved in the development of the NQST shall be seen as a source of experience and competent partners for the specialist sub-groups. These sub-groups will report to the Core Group.

The time-frame for the implementation of the four model approach should also be finalized by the Core Group. If all stakeholders reach an agreement about the four model approach in general, then the implementation procedure including the tests of preparation courses could be managed in a period of two years. Simultaneously the definition of the profiles for teachers, the remuneration regulations and other details could be undertaken to save time. This would only be possible if the Provincial TVET authorities wish to reap the dividends of this NAVTTC- led initiative in the shortest possible time. Otherwise it would claim a longer period. It is recommended in any case to fix a deadline of three years (maximum) for the implementation from the beginning, to set milestones for selected steps and to frame the evaluation and monitoring of the implementation by an annual reporting system.

Annex 1: The composition of human resources in TVET at present



Annex 2: Recommended solutions for strengthening the quality and quantity of teachers

The postgraduate studies for technical, commercial, agricultural and other fields (see Bachelor Commerce and others!)

The postgraduate studies for Bachelors replaced by a full-time pre-service study, may be by participation of the STI or completely provided by the university

Evaluating the time schedule for desicion:

