FINDINGS SUGGESTIONS AND CONCLUSIONS
FINDINGS OF THE STUDY

The findings of the study are based on the results obtained from the analysis of data. An account of the findings from different aspects of the study is given below.

➢ FINDINGS FROM PERCENTAGE ANALYSIS OF OPERATOR CATEGORIES

From the percentage analysis of the individual operator categories, an overall demographic profile for the operators can be determined. The overall operator population were mostly married and belonged to 36-45 years age group. The operator population was dominated by males except in the case of sewing machine operators who had only a marginal increase in male population. They mostly belonged to families having 2-4 members and were educated up to 5th standard except in the case of sewing machine operators who belonged to the 11th-12th standard category. It should be mentioned here that only 3.9% of the operator population were graduates and only 0.5% belonged to the above graduation level.

Further, regarding technical qualification it had to be noted that most of the operator population under study was not technically qualified. Only 4.6% of the population had exposure to technical qualification. However the operators on the whole had an experience of 4-5 years and drew salary ranging from 13,001-16,000 rupees. The maximum number of operators had no exposure to training. Only 26.4% of the operators have reported to have exposure to some form of training other than on-the-job training. Of these 26.4% of the operators, 65.7% of them have attributed their exposure to training as a result of experience from working in previous firms.

➢ FINDINGS FROM PERCENTAGE ANALYSIS OF SUPERVISOR CATEGORIES

From the percentage analysis of the supervisor categories, it was noted that the supervisors were highly experienced, having an average experience of 5-7 years and belong to the age group of 32-38 years. Although 39.2% of them are undergraduates and 40.5% are qualified up to higher secondary level. Males were found to dominate the supervisor population as they comprised 98.7% of the supervisor population. Most of them were married and drew salaries of above 25,000 rupees. Among supervisors 69.6% surveyed belonged to small enterprises reflecting the nature of industry at Tirupur, which is dominated by small firms.
FINDINGS FROM KRUSKAL WALLIS TEST ON THE DEMOGRAPHIC VARIABLES OF OPERATORS (SELF EVALUATION) AGAINST SKILL DIMENSIONS

Basic skills, especially appearance and attitudes and self motivation skills are found to vary significantly with marital status indicating that married people are better at these set of skills.

Basic skills, especially attitudes and self motivation skills are found to vary significantly with respect to the various age groups indicating that age has an influence on these set of skills.

Soft skills namely communication, self motivation and problem solving, basic skills namely appearance, attitude and basic literacy skills namely reading and writing and basic mathematical skills vary significantly with respect to sex indicating that the sexual status has an influence on these skills.

Appearance skills were found to vary significantly with the number of members in the family, indicating that this variable has an influence on this skill.

None of the skills namely soft skills, basic skills and basic literacy and numeracy skills and their sub constructs are found to vary with educational background of the worker indicating that advancements in educational status cannot bring a corresponding increase in skills.

None of the skills namely soft skills, basic skills and basic literacy and numeracy skills and their sub constructs are found to vary with the worker’s possession of technical qualifications indicating that advancements in technical education cannot bring a corresponding increase in these skills. It should however be noted here that all the above mentioned skills are non technical in nature.

None of the skills namely soft skills, basic skills and basic literacy and numeracy skills and their sub constructs are found to vary with the experience in years indicating that experience cannot bring a corresponding improvement in these skills. All the above mentioned skills are non technical in nature and these results need not have similar implications for technical skills.

Soft skills namely communication, time management, self motivation, problem solving, basic skills namely punctuality, appearance, attitude and basic literacy skills namely reading and writing skills vary with respect to monthly income indicating that income has an influence on these skill sets.

All the skills types are found to vary with respect to the category of operators indicating that different types of operators require different proportions of various non technical skill dimensions.
Soft skills namely communication, self motivation and problem solving, basic skills namely appearance and attitude and basic literacy skills namely basic mathematical skills are found to vary with exposure to training indicating that training has an influence on these skill sets.

Soft skills namely communication, time management, self motivation and problem solving, basic skills namely punctuality, appearance and attitude and basic literacy skills namely reading and writing and basic mathematical skills are found to vary with the source of training indicating that the source of training delivery has an influence on these skill sets.

> **FINDINGS FROM KRUSKAL WALLIS TEST ON THE NON TECHNICAL SKILLS OF OPERATORS (SELF EVALUATION) AGAINST OPERATOR CATEGORIES**

Soft skills namely communication, time-management, self-motivation and problem-solving, basic skills namely punctuality, appearance and attitude, language skills and basic literacy skills namely reading and writing and basic mathematical skills are found to vary with the operator categories indicating that different operator categories have different requirements of non technical skills.

> **FINDINGS FROM KRUSKAL WALLIS TEST ON THE NON TECHNICAL SKILL REQUIREMENT OF OPERATORS (SUPERVISORY EXPECTATION) AGAINST OPERATOR CATEGORIES**

Soft skills namely communication, time-management, self-motivation and problem-solving, basic skills namely punctuality, appearance and attitude, language skills and basic literacy skills namely reading and writing and basic mathematical skills do not vary with the operator categories indicating that different operator categories are not expected to possess different non technical skills.

**NOTE:** The difference in findings regarding nontechnical skill requirement of operators was highlighted when different nontechnical skills sets of operators against different operator categories was tested by Kruskal Wallis test according to (i) self evaluation of operators and (ii) supervisory evaluation as discussed above. When the self evaluation revealed that, different operator categories require different sets of non technical skills, the supervisory evaluation claimed that different operator categories do not require have different sets of non technical skills. There is a difference in perception of the operators and the expectations of the supervisors with regard to the non technical skill sets of the operators.
FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING KNITTING MACHINE OPERATORS (KMO) SELF EVALUATION WITH KNITTING MACHINE SUPERVISOR (KMS) SUPERVISORY EXPECTATION AGAINST VARIOUS DIMENSIONS OF NON TECHNICAL SKILLS

Soft skills namely communication, time management, self motivation and problem-solving, basic skills namely punctuality, appearance and attitude, and basic literacy skills namely reading and writing of knitting operators were found to vary with the (i) self evaluation of knitting machine operators and (ii) supervisory expectation by knitting supervisors. Hence there is a gap in the above mentioned skills.

FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING CUTTING MACHINE OPERATORS (CMO) SELF EVALUATION WITH CUTTING MACHINE SUPERVISOR (CMS) EXPECTATION AGAINST VARIOUS DIMENSIONS OF NON TECHNICAL SKILLS

Soft skills namely communication, time management, self motivation and problem-solving and basic skills namely punctuality, appearance and attitude of cutting machine operators were found to vary with the (i) self evaluation of cutting machine operators and (ii) supervisory expectation by cutting supervisors. Hence this exposes the gap in the above mentioned skills.

FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING SEWING MACHINE OPERATORS (SMO) SELF EVALUATION WITH SEWING MACHINE SUPERVISOR (SMS) EXPECTATION AGAINST VARIOUS DIMENSIONS OF NON TECHNICAL SKILLS

Soft skills namely communication, time management, self motivation and problem-solving, basic skills namely punctuality, appearance and attitude and basic literacy skills namely reading and writing and basic mathematical skills of sewing machine operators were found to vary with the (i) self evaluation of sewing machine operators and (ii) supervisory expectation by sewing supervisors. Hence this exposes the gap in the above mentioned skills.

FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING OPERATORS SELF EVALUATION AND SUPERVISORY EXPECTATION OF TECHNICAL SKILLS OF KNITTING MACHINE OPERATOR

Technical skills such as notifying supervisors or repair staff of mechanical malfunctions, loading or unloading material or work-piece into the machinery and
stopping machines when the specified amounts of product have been produced have shown a positive skill gap.

Few technical skills such as repairing or replacing worn out or defective needles and other components using hand tools, programming electronic equipment and inspecting products to ensure that specifications are met determine if the machines need adjustments shows the presence of negative skill gap.

➢ FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING OPERATORS SELF EVALUATION AND SUPERVISORY EXPECTATION OF TECHNICAL SKILLS OF CUTTING MACHINE OPERATOR

Technical skills such as placing patterns on top of layers of fabric and cutting the fabric following the patterns using appropriate cutting devices, repairing or replacing worn or defective parts or components using hand tools, inspecting machinery to determine if repairs are needed, inspecting products to ensure that specifications are met and to accordingly set machine adjustments and starting the machine by oneself show the presence of a positive skill gap. However the skill of periodically cleaning, oiling and lubricating the machines displayed a negative gap.

➢ FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING OPERATORS SELF EVALUATION AND SUPERVISORY EXPECTATION OF TECHNICAL SKILLS OF SEWING MACHINE OPERATOR

Technical skills such as taping or twisting the thread together and handle breaks, starting and operating machines whether single or double needled, performing equipment maintenance tasks such as replacing needles, sanding rough areas of needles or cleaning and oiling sewing machines and folding or stretching edges or lengths of items while sewing in order to facilitate forming of specialised sections reveal a positive skill gap.

Other technical skills such as adjusting the settings of machines according to garment specifications, selecting supplies such as fasteners and thread according to job requirements, mounting attachments such as needles, cutting blades or pattern plates, monitoring machine malfunctions, matching cloth pieces in correct sequences prior to sewing to verify that the dye lots and patterns match and examining and measuring finished articles to verify conformance to standards expose a negative skill gap.
### TABLE 1.48 INVENTORY OF CRITICAL NON TECHNICAL SKILLS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Skill elements</th>
<th>KMO [nature of skill gap]</th>
<th>CMO [nature of skill gap]</th>
<th>SMO [nature of skill gap]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>1.</td>
<td>Soft skills</td>
<td>communication, time</td>
<td>NIL</td>
<td>communication, time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>management, self</td>
<td></td>
<td>management, self</td>
</tr>
<tr>
<td></td>
<td></td>
<td>motivation, problem-</td>
<td></td>
<td>solving</td>
</tr>
<tr>
<td>2.</td>
<td>Basic skills</td>
<td>punctuality, appearance,</td>
<td>NIL</td>
<td>(punctuality, appearance,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>attitude</td>
<td></td>
<td>attitude</td>
</tr>
<tr>
<td>3.</td>
<td>Language skills</td>
<td>NIL</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>4.</td>
<td>Basic literacy skills</td>
<td>reading and writing</td>
<td>NIL</td>
<td>NIL</td>
</tr>
</tbody>
</table>

NIL = Not Important
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category of operators</th>
<th>Positive Gap</th>
<th>Negative gap</th>
</tr>
</thead>
</table>
| 1.     | KMO                   | (i) knowing when to notify supervisors or repair staff of mechanical malfunctions  
        |                       | (ii) loading or unloading material or work-piece into the machinery and  
        |                       | (iii) stop machines when the specified amounts of product have been produced. | (i) repairing or replacing worn out or defective needles and other components using hand tools,  
        |                       | (ii) programming electronic equipment and  
        |                       | (iii) inspecting products to ensure that specifications are met and to determine if the machines need adjustments. |
| 2.     | CMO                   | (i) placing patterns on top of layers of fabric and cutting the fabric following the patterns using appropriate cutting devices  
        |                       | (ii) repairing or replacing worn or defective parts or components using hand tools (iii) inspecting machinery to determine if repairs are needed  
        |                       | (iv) inspecting products to ensure that specifications are met and to accordingly set machine adjustments and  
        |                       | (iv) starting the machine by oneself | (i) periodically cleaning, oiling and lubricating the machines |
| 3.     | SMO                   | (i) tape or twist the thread together and handle breaks  
        |                       | (ii) starting and operating machines whether single or double needled  
        |                       | (iii) performing equipment maintenance tasks such as replacing needles, sanding rough areas of needles or cleaning and oiling sewing machines and  
        |                       | (iv) folding or stretching edges or lengths of items while sewing in order to facilitate forming of specialised sections. | (i) adjusting the settings of machines according to garment specifications  
        |                       | (ii) selecting supplies such as fasteners and thread according to job requirements  
        |                       | (iii) mounting attachments such as needles, cutting blades or pattern plates  
        |                       | (iv) monitoring machine malfunctions  
        |                       | (v) matching cloth pieces in correct sequences prior to sewing to verify that the dye lots and patterns match and  
        |                       | (vi) examining and measuring finished articles to verify conformance to standards. |
FINDINGS FROM MANN WHITNEY U TEST FOR COMPARING THE VET IMPLEMENTATION STRATEGIES BASED ON THE MANAGERIAL PERCEPTION AND TRAINER PERCEPTION

1. STRATEGIES PREFERRED BY BOTH THE TRAINER AND MANAGER

Both the trainers and managers jointly agreed that the lack of awareness about global changes, the increased rates of school drop outs and the existing educational profile of the workers in Tirupur (strategies 1, 2 and 3 from the VET implementation instrument) were ideal preconditions to the implementation of VET.

VET implementation strategies that were jointly agreed to were the following
(i) Information centres pertaining to vocational education and training opportunities should have adequate coverage in Tirupur district.
• (ii) The vocational education and training systems implemented should cater to the affordability of all income groups.
• (iii) The vocational education and training system should possess good quality infrastructure to cater to the needs of the industry.
• (iv) Implementation of systematic and structured training practices and their evaluation to improve training quality
• (v) The vocational education and training system should have adequate focus on improving deficient set of skills.
• (vi) A nationally recognised skill qualification framework or skill standards should be made available for critical jobs in the industry.
• (vii) An appropriate certification mechanism should be established through industry-government collaboration.
• (viii) The vocational education system should offer due credits for an ITI student while seeking admission to a university (higher education)
• (ix) Outsourcing of short term training courses at nominal cost to private players and motivating them could increase the available source of training.

2. STRATEGIES PREFERRED BY THE TRAINER

The following strategies were preferred by the trainer.
(i) There should be awareness on the prospects of vocational education and training through advertisements and publicity campaigns.
• (ii) The vocational educational institutions should have well trained teachers with industry exposure.
• (iii) The vocational training centres require experienced trainers with industry exposure to impart quality training.
• (iv) The vocational education and training schemes need to be continuously monitored and reoriented to the changing needs of the industry.
• (v) The vocational education courses should incorporate worker skill development in their curricula.
• (vi) Vocational training should be a well defined process right from implementation to evaluations and follow up.
• (vii) The vocational education and training system in India should adopt global quality standards
• (viii) The vocational education and training systems should offer options to move from vocational training to higher education and vice versa.
• (ix) Public private partnerships should be utilised to attract more investments which are required for the skill development of workers.
• (x) Public Private Partnerships should be monitored based on their outcome to skill development.

3. STRATEGIES PREFERRED BY THE MANAGER
   (i) Vocational training schemes designed need to cover people in remote areas
SUGGESTIONS

REGARDING SKILLS

The current research work has identified several findings based on the objectives for which the study was implemented. The initial part of the study derived valuable inputs from demographic profiling of workers. It is found that advancements in educational status cannot bring a corresponding increase in skills. Reviews from previous literature also show that formal education alone is not a measure of skill (Goldin and Katz, 1996, Lowenstein and Speltzer, 1996, Lucas 1997, Murname, Willet and Levy, 1995).

However a certain amount of basic education is necessary for the acquisition of other technical skills. There has been literature supporting the necessity for basic literacy skills provided by basic education (Colvin, 2005 and Achieve, 2005). In the current study age and marital status are found to have an impact on aspects of non technical skills. This is an indication that the passing of time delivers live experiences, also influenced to a certain extent by education coupled with effects of agglomeration, sensitises people to nontechnical skills.

Importance of non technical aspects of skill has been recorded in few of the early researches. Marshall (1991) connected increased skills to increased wages and in this connection he emphasised the importance of problem solving, teamwork, interpersonal skills and innovation. Keim and Strauser (2000) suggested that people fail to maintain employment because of lack of social skills or interpersonal skills. Communication helps employees recognise and improve their ability to judge appropriate behaviour in others, absorb stress, deal with ambiguity, listen, inspire confidence in others, share responsibility and interact easily with others. Workers not trained in communication have negative effect on the company (Carnevale, Gainer, Meltzer and Holland, 1998).

(Moser 1999) has reported that the increasing importance and role which technology plays in society are making basic literacy skills more significant. International research has shown that economic performance is seriously threatened by low literacy levels (Benton and Noyelle, 1992). (ALBSU, Gallup, 1993) in their survey on basic skills in London estimated that the problems in basic literacy skills are costing business more and the government is encouraging initiatives that attempt to tackle basic skill failings and their negative consequences.

To proceed in a job training or vocational training programme the worker must have the basic skills (reading and maths) and motivation to learn, without which they cannot succeed
Further people with low basic literacy skill levels are less likely to access training at work (Bynner and Parsons, 1997). People with low basic literacy skills are frequently found to be poor at work related skills and require extended education and training (Bynner and Parsons, 1999). Good basic literacy skills and oral communication skills have become very significant as they are required to undertake a wide range of workplace activities safely and effectively. Personal service jobs and plant vehicle and machine operatives are occupations where basic literacy skill competencies acquire more importance (IES, 1993). There is a widening gap between opportunities available for people with and without good basic literacy skills and people whose basic literacy skills are limited are increasingly marginalised.

➢ REGARDING SKILLS SHORTAGES

The subsequent part of the current study focussed at assessing the skill and the concurrent skill gap of the operative workers. Skill shortages have a negative impact on the performance of small and medium sized firms. Skilled workers are a crucial input to the production process (Tang and Wang 2005). Skill shortages mean high turnover rates among skilled labour which increases replacement costs such as transaction and learning costs (Griliches, 1969; Nelson and Phelps, 1966).

The findings on skill shortages has culminated in framing an inventory for critical skill sets with reference to the operative workers chosen for the study. All the three categories of operators have revealed a positive skill gap in aspects of non technical skills. Soft skills, namely, communication, time-management, self motivation and problem solving, basic skills namely attendance, appearance and attitude and basic literacy skills such as reading and writing were the non technical skill aspects showing a positive skill gap indicating a necessity for enhancing these skills. Similarly a positive gap was noted in certain aspects of technical skills.

A positive gap is an indication of the need for skill development strategies. For this, strategic changes must be introduced in the existing training and educational systems via academic, technical or vocational streams. The educational system must be strengthened to reduce the rates of school dropouts. Vocational education and training systems can be implemented at Class X level itself as 26.1% of operators were found to belong to class ‘6-10’, category and 27.4% of operators on the whole belonged to ‘11th-12th’ category. This would enable the prospective candidates who are unable to pursue an academic career to opt for the vocational stream rather than putting an end to their education. This observation is
also in concurrence with the work of (Carnevale, 1989) who observed that although relatively few people excel in academic settings almost everyone is able to learn on the job by being coached by peers or by attending formal courses.

A negative gap indicates that the skill requirement of the operator was more than what was expected. This meant that there existed an underutilisation of skills. Underutilisation of skills may lead to demotivation of workers for which suitable job enrichment practices should be enforced at the firm level. They may be motivated monetarily and given additional responsibilities in recognition of their unutilised skills.

**REGARDING SKILLS DEVELOPMENT**

It is noted in the current study that many employers appear reluctant to offer generic skill development opportunities. There should be a shift in thinking with regard to skill development and maintenance in line with the contemporary perspectives on employability. Preference for job specific training designed to bring immediate results rather than generic training designed to prepare employees for future employment was also reported (Carbery and Garavan, 2005). The employers fear that up skilling employees will increase the likelihood that they will leave for a better paid position in another organisation (Baruch 2001). The push towards casualisation of labour with primary use of labour only through subcontractors and dismantling of traditional apprenticeships is often presented as the primary reason for a reduced employer commitment to training (Harvey 2001). Organisations invest resources on training and development and hence they should be designed to cater to firm specific training needs (Raj, 2005). Efforts to increase skill should not adversely impact acquisition of basic skills knowledge.

Skill gaps are significant barriers to the development of any industry. Addressing shortages will require concerted and focussed efforts from all stakeholders. The industry, Government and educational system should identify strategies and mobilise resources to address the skill issues and meet the challenges.

**REGARDING VET IMPLEMENTATION STRATEGIES**

While implementing strategies jointly preferred by the trainer and the manager, can target both the industry at large as well as individual firms, the strategies preferred by the trainer, should ideally target the industry at large. Implementing strategies preferred by the manager should target individual firms. This kind of a combination approach could be wholesome acting at all levels to effectively target skill development.
CONCLUSIONS

Globalisation has brought about enormous challenges which need to be addressed. The acute scarcity of skilled labour to man the workforce is evident in several literatures reviewed. The skill needs at the global level need to be met at a rapid rate. Besides considering the demographic leverage India has, in comparison with the other countries, further spells the need of skilling the workforce.

For this purpose the current skill gap was analysed for the chosen operator categories, as an initial step to identify the current and future skill needs. A significant skill gap was noticed in several aspects of nontechnical and technical skills and this was summarised in the skill inventory prepared for the operative workers under the purview of current study. In some cases there was a significant positive gap and in certain other cases there was a significant negative gap. While a positive gap indicates the need for improvement or enhancement in skills, a negative gap is an indication of over skilling. A positive gap undermines performance due to lack of skills, a negative gap causes de motivation due to excess skills which go unrecognised. A negative gap also hampers performance. Gaps for critical skills have to be targeted by suitable interventions or skill development strategies. The skill gap analysis resulted in an inventory of critical skills.

Tirupur knitwear industry being an unorganised sector should handle the problem of skill gap in different dimensions. Skill development strategies can be approached in two ways (i) top-bottom and (ii) bottom-up. The top-bottom approach is supply-driven and deals with strategies imposed by way of government policies and funding for skill development while the bottom-up approach is demand driven and deals with strategies for skill development of workers at firm level.

VET (Vocational Education and Training) implementation strategies were identified as a vehicle for the entry of skills into the labour market. Here a top bottom approach was used to generate VET implementation strategies that could target critical worker skills. The study hence had a combination approach which was wholesome to worker skill development. Regarding VET implementation strategies which were suitable for Tirupur Industry, the current research work not only identified the most significant strategies but also was able to categorise the strategies into three groups based on the acceptability of the strategies. Certain strategies found favour with the managers and certain others with the trainers . However some gained the support of both the trainer and the manager. This information is vital in deciding at what level a particular strategy must be implemented to gain acceptance.
The current research work has explicitly demonstrated the demographic profile of the operative workers as vital in revealing meaningful insights regarding the target population for whom the skill development strategies need to be planned. It is evident that skill development strategies should target a married, male dominated population, falling predominantly in the age group of 36-45 years age, having an average education of up to 5th standard (in certain cases up to 12th standard) and almost no technical qualification, the maximum people having acquired training through experience gained as a result of working in previous firms.

The inventory of critical skills which was generated for the operative workers of Tirupur Knitwear Industry could be used at firm level for purposes of manpower planning and for identifying future training needs for the operatives. At the level of the industry at large, the same data could be used to identify VET implementation strategies that could specifically target the critical skills.

Moreover perceptions on skill requirements regarding the operators are different from the supervisors. So also the perception of the managers and trainers has also showed differences regarding implementation of VET implementation strategies. Dzasu and Ayegba (2010) have reported that the attitudes of managers are crucial in the proper implementation of a training scheme and more often it acts as a constraining factor.

The study indicates that concerted efforts from (i) the industry, (ii) trainers, (iii) training organisations, and (v) government initiatives are vital in combating skill gap. With respect to worker skills proper VET implementation can act as a passage of entry of skills into the labour market. The current economic slowdown being faced by the Tirupur knitwear industry is a passing event. Global changes have made an impact worldwide, and Tirupur is no exception. This combination approach could prove to be an effective way to handle the skill needs of the Tirupur Knitwear Industry. Results from the study can be used to effectively curtail and check the skill gaps and also to handle the skill maintenance functions.