CHAPTER 1

INTRODUCTION

1. INTRODUCTION

In the present era, the world is transforming rapidly with diverse constraints and challenges. Currently, globalisation is emerging as a principal force in shaping the economic status of the countries across the world. It tries to resolve the trade barriers between developed and developing nations and promotes the integration of nations’ economies through financial flow. Due to this transformation, there is a fast progress in engineering, technology and business sectors. In turn, global employers are looking for employees with unique skill sets to meet the global clients. Some of the skill sets are the ability to communicate, work in teams, excel in professional skills, learn willingly, and grow with positive adaptability, exhibit work ethics, and leadership skills. They are also looking for employees who can think holistically, innovate, work in teams, amalgamate and integrate ecological and societal values and beliefs in their work.

Today, over 60 percent of jobs are in the service sectors, which comprise high escalation package and skillful profession in the emerging industries. The deep-seated changes in the industry and commerce are demanding new and exceptional skill sets. In these days, never before, individuals must be able to execute non-routine, creative and odd jobs if they are to achieve. While skills like self-regulation, creativity, critical thinking and innovation may not be fresh to the contemporary century, they have recently become more relevant and expected as a crucial requirement.

In the radiance of employability skills, irrespective of regions or field, there is always a skill gap between the skills projected by the employers and what is actually available with the graduates. There is a pervasive
consensus, however, that the engineering education systems are deteriorating to passably prepare all students with the essential updated knowledge and skills necessary to succeed in life and career. The concern of a skill space seems to get complicated in the present day environment due to inestimable factors such as globalisation, technological developments, and faster obsolescence rate in information technology, multi-cultural working environments, international competition, demands of the present cohort and the like. Though initiatives and measures are in the continuous updating process at the national and international levels, they are not able to zero down on the skill gap.

According to an India Skills Report (2015) published by Confederation of Indian Industries (CII), only 37% of the graduates of India are employable. The report also says that 38% of the women and 34% of men candidates of India are employable. Azim Premji, Chairman of WIPRO remarks, “The challenge before the industry does not lie in the supply of talent, but rather than that of employability” as quoted in ELT Voices (2014).

According to a UNESCO Report (2012), young people continue to be the hardest hit by the job crisis with 74.8 million youths being unemployed in 2011, an increase of more than 4 million since 2007. The global unemployment rate shows an increase from 5.6 percent in 2007 to 6.2 percent in 2010. According to a World Bank Report (2011), 64 per cent of the employers have said that the performance of the engineering graduates in India is not up to the level of satisfaction. There is a gap between graduate attributes not only in their employment readiness but also in their employability skills (Freudenberg et al. 2011). Most of the employers have persistently identified communication, interpersonal and teamwork attributes as proficiencies. Showery Mendemu (2016) points out that India has to analyse the skill requirements, take stock of skill inventory, skill matching, de-skilling and re-skilling in the form of acquisition of new skills for the
digital age. According to Sajja Divya & Ratna Kishor (2016), an engineering student should learn to differentiate between formal versus and informal and workplace versus social situations in order to equip himself or herself with soft skills. This learning will facilitate the students to work in the global atmosphere.

In this scenario, India is ever more looking to academia to produce human resources with the distinct kind of competencies, skills, and knowledge to meet the 21st century needs. The technical universities are expected to facilitate knowledge-based economy and cutting edge technology through an effective coalition between institutes and industry. Preparing young people for the job market has, therefore, become a significant responsibility of higher education institutions. In fact, the quality of engineering institutions is assessed in terms of placement records, post-graduation opportunities, and academic accomplishments.

Tamil Nadu is a pioneer state for having the largest number of engineering institutions in India. Most of the institutions also offer research programmes. The number of institutions has also grown by an order of magnitude in the last two decades, in the private sector. There are 97 % of self-financing educational institutions contributing to engineering education and 75 % of them are located in semi-urban and rural areas. This rapid expansion has raised serious concerns about the quality of engineering education in these institutions. Hence, developing employability skills has become significant in the state of Tamil Nadu.

1.1 ❌ AIM AND SCOPE OF THE STUDY

1.1.1 ❌ Purpose

The objective of this study is to bridge the gap between technical institutions and industry and to enhance the employability of engineering students through soft skills training. It examines the need to equip the
students and faculty with updated curriculum resourceful materials and methods to acquire soft skills and recommends a new perspective to the discipline of soft skills.

Further, this study explores 1) Soft skills curriculum framework, 2) Region wise needs, challenges and transformations of students, faculty of English in engineering institutions and employers of industries, 3) Soft skills development through alumni mentoring relationship programmes and 4) Communication skills assessment model using rubrics.

1.1.2 Scope

The study is restricted to the analysis of enhancing the students’ employability skills through soft skills training in engineering institutions of Tamil Nadu. The research contemplates on soft skills like communication skills, team building expertise, problem-solving abilities, self-management proficiencies, multi-cultural understandings, etc. The affiliated institutions of Anna University, Chennai, and the software companies, manufacturing units and service sectors in and around Tamil Nadu have been considered in the study.

1.2 Hypothesis

The set of hypotheses formulated for the present study includes the following:

1. The curriculum of soft skills like the ability to communicate, problem-solving and critical thinking, leadership and team building skills in engineering institutions maximise the engineering students’ scope for employment.

2. The study of the needs of students and faculty of soft skills at engineering colleges reveals the preferences and importance.
The challenges of engineering graduates and soft skills trainers surmount and transform during apt transactions.

3. Employability skills are enhanced through student mentees - alumni mentoring programme.

4. Communication skills assessment model is effective using rubrics.

1.3 ENGINEERING EDUCATION, EMPLOYABILITY AND SOFT SKILLS

1.3.1 Engineering Education

Engineering, in theory, and practice as well, is very much a societal activity, with political, ethical and economic magnitudes. It is a reality that there is a universal transformation in engineering education preoccupied with industry needs. Employment in engineering deserves multiplicity of skills, including soft skills. Engineering and technology are prominent in contributing towards the economic development and global membership. The present day society is acclaimed to be an information world, knowledge society, and network community. The globe is passing through a transformation and many firms have curved into knowledge-intensive innovation centers in which reciprocated work, networking, and transformative and ingenious learning have become key concepts for organisational expansion. In turn, engineering education is also expected to transform accordingly with regard to industry’s transformations.

1.3.2 Employability Skills

According to Hillage and Pollard (1998), employability is an individual’s ability to gain initial employment, move between roles within the same organisation, obtain new employment if required and (ideally) secure suitable and sufficiently fulfilling work. Employability not only depends on
whether one is able to fulfil the requirements of specific jobs but also on how one stands relative to others within a hierarchy of job seekers (Brown and Hesketh 2004). Employability skills to be mastered by employable graduates and freshers include communication, team working, leadership, initiative, problem-solving, flexibility and enthusiasm. Yorke and Knight (2006) suggest that it is a set of achievements, skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the community and economy.

It is a well-known fact that knowledge, skills, and resourcefulness of people are vital to sustain social and economic development in a knowledge society. The significance of employability is industry readiness and enhancing graduate employability skills which are considered an important requirement within the Indian technical institutions. The needs of the job market and the employers’ requirement of graduates with soft skills diverge from employer to employer and also from one country to another country. Changes in the current industry environment highlight the importance of education for employability, focusing on the development of not only skills but also practical experience. Then, in order to enhance competitive advantage for graduate employment, students need to develop employability skills in addition to the acquisition of technical knowledge.

In the most recent decades, the industry and business have been influenced significantly and have ‘transitioned’ due to the impact of information technology, an extension of global markets, multi-cultural practices and the unpredictable competition compared to that being described only as ‘cut-throat’ typically. Due to this, there is a challenge for employers in recruiting a potential and fine-tuned work cultural employee.
Employability of engineering graduates passing out of professional institutions has been an area of apprehension. With India having a massive population in economically productive age group of 23-35 the fact that the country is likely to have nearly half of the human resource with employability uncertainties cannot be ignored. There is a need to analyse the prototype of skill development and personal development initiatives. With the speedy expansion of professional education system in India, academic qualifications have become important, but the aptitudes and attitudes of professional candidates are more imperative to the industry. High ranking alone does not promise employment and it is, therefore, vital for graduates to exhibit skill sets which are most sought after by their potential employers.

Employability skills are therefore a significant subset of a broader set of generic skills which have come under the sharpened focus of studies in the light of globalisation and related factors. Yet, from the industry point of view, only 25 per cent of students are employable since employable skills component is severely lacking in many students. The graduates might have technical skills, but these sub-skills are not up to the threshold. Consequently, firms do not come forward to take up such students. Hence, proficiency in soft skills is definitely a prerequisite for graduates and it improves their chance of being selected for employment. To realise this, Anna University, Chennai, India, has included Technical English I and II (Regulations 2013) and Communication and Soft Skills – Laboratory-Based (GE6674, 2015) courses in the curriculum ranging from the first to sixth semester, dealing with all aspects of English language and communication skills with emphasis on soft skills.

1.3.3 Soft Skills

Technical and job-related skills are a must, but they are not adequate when it comes to finding a job or climbing up higher positions. Soft
skills are largely people skills- the non-technical, indescribable personality-specific skills that determine one’s strengths as a leader, listener, negotiator, and conflict mediator. ‘Hard’ skills, on the other hand, are more along the lines of what might appear on one’s resume – one’s education, experience, and level of expertise. Soft skills is a phrase which refers to personality traits, social graces, facility with language, personal habits, sociability and optimism that scratch people to varying degrees.

Andre Iland (2013) opines that soft skills enable the employee to focus on real time problems and challenges that he/she faces ordinarily at the work place. Perrault (2004) defines soft skills as personal qualities, attributes, or the level of commitment of a person that set him or her apart from other individuals who may have similar skills and experience. James and James (2004) accept that soft skills are a new way to describe a set of abilities or talents that an individual can bring to the work place. Soft skills distinguish certain career attributes that individuals may possess the ability to work on a team, communication skills, leadership skills, customer service, and problem-solving skills. Employers value communication and specific skills and one who communicates effectively, gets along with others, embraces teamwork, takes initiative, and has a strong work ethics is considered to have an accomplished set of soft skills.

According to Page, Wilson, and Kolb (1993), hard skills are skills associated with technical aspects of performing a job and usually include the acquisition of technical knowledge, whereas soft skills are interpersonal, human, people, or behavioural skills. Soft skills are primarily affective or behavioural in nature and have recently been associated with Emotional Quotient (EQ) popularised by Daniel Goleman (1995). Hard and soft skills are now regarded by many researchers as being complementary. Kemper and McMurchie (1999) proclaim that the successful individual performance in the workplace requires both the types of skills and superior performers are
found to have high Emotional Quotient (EQ) as well as high IQ ratings. For example, research by Spencer and Spencer (1993) suggests that superior performers are not distinguished solely by the technical skills, but by the demonstration of certain motives, values, traits and attitudes, in other words, by the manifestation of good behavioural skills in addition to their technical ability. As such, non-cognitive skills play a vital role and come to be counted into the employability skills framework.

Soft skills are the ability required at the place of work for professional success. They are the most polite and pleasing way of presenting themselves to others and are mostly related to one’s traits, attitude, and behaviour. They are essential at each level of an organisation if it is to function efficiently and effectively. Hard skills are technical competencies and core knowledge, while soft skills are a combination of professional skills, interpersonal skills, communication skills, and emotional intelligence. It is now a well-established fact that industry and businesses are increasingly placing more prominence on soft skills; it is equally imperative that students should also sufficiently appreciate the value of such skills and make intentional efforts to acquire them.

1.3.4 Significance of Soft Skills

Soft skills play a striking role in one’s success in life, particularly in one’s career. They help one to excel in the workplace and their magnitude cannot be denied in this age of information and knowledge. In the highly competitive corporate world, soft skills will help employees stand out in a crowd of customary job seekers with ordinary skills and talent. Organisations, particularly those dealing with customers face-to-face, are generally more prosperous if they train their employees to use these skills. With the boom in outsourcing taking root across industries, and many professionals and subject matter experts directly dealing with their clients on a regular basis, soft skills
have become absolutely essential for the accomplishment of organisations and individuals. Soft skills are important as traditional hard skills to an employer regardless of industry or job type. But it is to be understood clearly that soft skills complement hard skills. Though soft skills play an incredible role in making students employable across the world immediately after completing their degree, it cannot replace hard skills.

The twenty-first century industry has experienced tremendous changes due to advances in technology; consequently, the ‘old way’ of doing things may be effective but not efficient (Redman & Kotrilik 2004). The issue is that the post-secondary education today focuses on syllabi alone and industries seek beyond what a syllabus is capable of teaching like communication and creative skills, and team spirit. Hence, educating engineering students with the comprehensive soft skills will enhance the scope of the employment and result in the country’s development. Moreover, a large economic sector, such as information technology, infrastructure, manufacturing, automobile, power, water, pharmaceutical, etc. rely critically upon technical skills as well as soft skills.

1.3.5 The Challenges of Incorporating Soft Skills in the Curriculum

Soft skills are personality traits and non-academic skills, and these skills cannot be taught or learnt like academic lessons. Soft skills are acquired and practised, and may not be developed by merely reading books on soft skills. Two reasons why soft skills are more difficult to acquire than technical skills are: 1. In many fields, there is resistance to learn these skills as these are deemed less important than technical skills. The value of having good soft skills is rarely regarded as important by employers, but the clients whom they serve will probably not agree with this view (Rainsbury et al. 2002). 2. Acquiring soft skills is difficult, because there is an intrinsic element of skill development, which is usually a longer process than merely a cognitive
learning. Since these soft skills lie on the existing skill level, and not only on cognitive level, they are successfully developed only when an individual’s knowledge and behaviour change.

In many developing countries, including India, the issue of incorporating soft skills into the curriculum taught to engineering students in technical institutions has gained momentum in recent years. Since the introduction of the new Outcome-Based Education (OBE) of the National Board of Accreditation (NBA 2012) criteria, many engineering institutions are making attempts to incorporate communication skills which are one of the soft skills in their curriculum. Soft skills seem to be difficult to teach and even harder to assess in the classroom. Personal attributes, attitudes to work and individual qualities are extremely difficult to evaluate and, in practice, proxies are used (Md. Abdullah-Al-Mamun 2012). Each of the soft skills research repeatedly implies incorporating skills instruction through curricula that rely heavily on examples, modeling, role play and constant practice. Cooperative learning and team-based training help the students to understand about skill areas.

1.4. PERSPECTIVES OF INDUSTRY

Different from previous times, the industry is moving through critical stages which necessitate the utmost amount of changes in products, processes, approaches, emergences and many other dynamics. Earlier, a trade would be producing only a few ranges of products and services with a minimum number of preferences, whereas today, multiplicity and novelty with wider implications and applications have become the buzz word. What variance a product or process or service marks of others is the theme. As a result, corporate is under profound pressure to go for a transformation. If this is right in a mechanised industry, it is more compelling in the highly competitive IT, electronics, infrastructure and other sectors. Every day, a new
challenge emerges and everybody looks for a tailor made solution. Dynamism is very much injected into the system. Hence, the qualities and training imparted in the academy for a usual solution will be totally inadequate to meet the latest needs and current trends.

Som Mittal (2009) pronounces that addressing the current skill gap is vital for the Indian IT industry to maintain its growth trajectory and move up the value curve. Skill gap here refers not only to the squat employability of the current graduate pool but also to the future needs of the industry in frontier technologies and functional domains. While the former will be addressed through upgrading the curriculum, facilities and faculty development in the academic institutions, the latter will require the academic institutions and industry to collaborate on pre-competitive research and develop specialisations. The main message of experts from educational institutions, employer federations, and engineering associations is that the technical universities need to revise the curriculum of soft skills and find suitable ways to transact and inculcate soft skills among the current engineering students.

1.5 NEED FOR THE STUDY
1.5.1 Need for Framing Soft Skills Curriculum

Educating engineering students with the comprehensive soft skills will be of great importance for enhancing the employability skills and also for the country’s development. Soft skills curriculum development is one of the key factors related to meaningful and successful programme improvement. These curricula are embodied in official documents (typically curriculum ‘guides’ for professors) and being implemented diligently by each academic discipline. Some universities have introduced soft skills as part of their curriculum. For instance, Anna University has introduced ‘Communication and Soft Skills’ Lab course (GE6674) for the third year B.E/ B. Tech
students. Most of the Management Schools in India have introduced soft skills curriculum and the arts and science colleges have also introduced this as one of the courses.

Most employers and researchers suggest that revising the curriculum of Technical Communication Skills Lab and other related courses are very momentous in this highly cut-throat world. The need to revise or eliminate outdated curriculum and develop new programmes to meet the emerging work trends is a seemingly endless occurrence (Shetty, 2010). There is a need to reform the curricula to increase the share of tasks where a student or a team of students leads its own problem identification, experiments and solves using engineering knowledge and methodologies (Andreas Bloom & Hiroshi Saeki, 2011). Richa Tewari (2012) affirms that a change is required in designing the curriculum, which should be oriented more towards equipping the student to manage and excel at the work place.

The aim of this study is to examine and explore the approaches and methods for creating opportunities for experiential learning of soft skills in the academic and workplace settings. This research explores the existing soft skills curriculum design to facilitate exercises on soft skills that will provide opportunities for experience, practice, reinforcement and reflection. Further, this investigation is to develop a professional curriculum to enhance the employability of engineering students, especially to identify the modules of soft skills from the perception of the employers, placement professionals, corporate trainers and observations from the newspapers and job websites on job opportunities. Distinctively, the study answers the following three questions.

1. Which skills do employers consider important when recruiting fresh graduates?
2. What will be the relevant soft skills curriculum in order to develop the employability of engineering students?

3. What are the topmost ten soft skills to be proficient in for the professional development?

4. What are the components and activities of soft skills modules?

1.5.2. **Necessities, Challenges and Transformations**

The study also intends at identifying the needs of the students, English faculty members of affiliated colleges, Anna University, Chennai and employers of South India. The study is conducted among Tier I, II and III colleges and industries. The survey is conducted with the following objectives in view:

1. The needs of the faculty who teach Technical English and train the students in Communication Skills and Soft skills at engineering institutions,

2. The challenges of the faculty,

3. The perspectives of Heads of English department and placement professionals on the needs, challenges and transformations and

4. The identification of a specific set of competencies for faculty at Engineering institutions based on the need survey.

1.5.3 **Soft Skills Development through Mentoring Programme**

Since the learning approach differs from student to student, it is indispensable to know an individual’s favoured learning style to improve his/her learning abilities. Students have different learning styles and they learn best by listening to lectures, understanding in doing tasks and listening to video clippings. Some adults learn by accessing electronic resources and
others by doing some hands-on practices. Some students wish to learn from their peers and their seniors.

To achieve the desired standards and to bring out the maximum learning outcome, institutions need to adapt to engineering students’ needs and identify new learning approaches and methods. Social cognitive learning (Bandura 2011), for example, role modelling, observing and imitating, is used, especially by young children and adolescents, and is the basis of the mentoring or coaching strategies. Mentoring programme provides an opportunity to build the potential of employees and also professional students who are likely to become employees after graduation. It presents a forum to offer constructive and honest advice to support the career development of the students. Mentoring has long been acknowledged as a strategy for developing individuals, both professionally and personally.

In mentoring relationships, students develop and learn through discussions with more experienced mentors who share knowledge and skills that can be incorporated into their thinking and practice. Formal mentoring programmes are now characteristically found in a variety of organisations, including industry, businesses, educational institutions, and service providers. Additionally, a number of successful consulting practices are devoted to help organisations design and implement mentoring programmes.

The third part of this research explores to develop career skills of professional students through student mentees-alumni mentoring relationship programme. A questionnaire has been prepared with open and closed questions separately for the students on their feedback and alumni on their facilitations. The researcher has conducted a series of two semi-structured interviews and the results indicate that the students have enhanced employability skills and have acquired guidance and support from the alumni mentors and have obtained the industry exposure. The purpose of this
research is to bridge the gap between college and industry to develop career skills of engineering students with the student-alumni mentoring model. The study is directed by the following questions:

1. What are the engineering and management students’ motivations for involving in the student mentees - alumni mentor programme?

2. In what ways do the students and mentors enrich the mentoring relationships?

3. How does the mentoring programme meet students’ expectations?

4. How does the mentoring relationship enhance career skills?

1.5.4 Communication Skills Assessment Model Using Rubrics

The final part of the study uncovers how rubrics supplement to equip students with communication skills and how the facilitators the performance of students. Rubrics are extremely useful and flexible assessments that provide appropriate feedback, prepare students to use detailed feedback and facilitate communication with others. Assessing students’ communication skills using rubrics provides a quick overview of valuable information about how they are progressing and areas for improvement. Hence, the research focuses on communication skills assessment model using rubrics.

The twenty-first century has brought bountiful opportunities for the millions, with more focus on the enhancement of students’ overall capability apart from academic proficiency. Many students, prominently those from non-English medium schools, find that they are not favoured due to their inadequacy in communication skills, even though they are good at their technical knowledge in countries like India. Keeping in view their industry
and business needs and professional requirements, the technical universities have introduced the courses exclusively for communication skills development.

As the educational institutions have an interest in the use of assessment to support the learning process, rubrics have become instrumental in informing students about ‘what counts’ in completing a particular task increasingly. From the perspective of student assessment, a rubric is a scoring guide for evaluating student work.

This study finds how rubrics enhance the learning and how the faculty members can improve the performance of students as they analyse the students’ progress before and after the introduction of rubrics. The study has been conducted on the assessment of communication skills using a rubric in Jayam College of Engineering and Technology, which offers NBA accredited engineering degree programmes. Consensus has been built regarding competencies for communication skills rubrics by working with faculty members of technical institutions. Peer- and teacher-assessment convergence is analysed from an analytical and holistic perspective. Students’ perceptions of validity and usefulness are determined from a questionnaire developed ad-hoc for this study. The study explores these issues and raises the following research questions:

1. What are the competencies of communication skills needed, for example, resume writing, oral presentation, group discussion, interview, and speaking skills?
2. How do faculty members of engineering institutions assess the performance of engineering students’ ‘communication skills’ using rubrics model?
3. How does the assessment model enhance the communication skills of the students?
1.6 METHOD OF STUDY

The main objective of the study is to identify important soft skills and to explore the possibilities of incorporating in the curriculum some essential skills which the engineering students need in the workplace. With this aim, the researcher has studied related literature and gathered and analysed information on soft skills curriculum to gain realistic insights into learner needs and industry expectations. The necessary data for the study have been collected through an interview schedule. The researcher has prepared two different interview schedules, one for the employers and the other for the placement professionals of engineering colleges.

The study is carried out in three parts, based on a specially designed questionnaire, semi-formal interviews and observations from the journals, newspapers and job websites. Reliability and validity of the questionnaire are established. The factor structures of the major tools used are tested using exploratory factor analysis and confirmatory factor analysis.

The collected details have been analysed and interpreted objectively. About the sample, it is necessary to mention that the placement professionals like placement officers and soft skills trainers of the engineering institutions who arrange for training and campus interview for the students have participated in the study. The questionnaire design is built upon three sources: the Graduate Attributes of NBA (2012), previous employer surveys, and consultations with employers. The questionnaire has been prepared with 25 different skills and employers are asked to evaluate the level of importance of each of the 25 skills on a five-point scale.

1.7. OVERVIEW OF THE CONTENT OF THE CHAPTERS

Chapter 1 Introduction gives information about the research, background of the study, objectives and limitations of the research
Chapter 2 **Review of Literature** analyses the related research from various sources like national and international journals, books, periodicals and web sources.

Chapter 3 **Research Methodology** discusses the methodology adopted for the study area.

Chapter 4 **Analysis and Interpretation** present the results and the discussions of the survey and experimental methods.

Chapter 5 **Conclusion** presents the major findings, recommendations and scope for further research.

The next chapter will deal with the review of literature collected from various sources like books, journals, periodicals and web sources.