THE ROLE OF SELF-ESTEEM AND GENERAL SELF-EFFICACY ON COMPETENCE OF TEACHERS IN ENGINEERING COLLEGES IN KERALA

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Certificate

This is to certify that the thesis titled **"The Role of Self-Esteem and General Self-Efficacy on Competence of Teachers in Engineering Colleges in Kerala"** is a record of bonafide research work of **Rama L.,** full - time research scholar with Reg. No. 3912 under my supervision and guidance. This thesis is the outcome of her original work. I further certify that this thesis is not previously used for the award of any degree, diploma, associateship, fellowship or other similar title or recognition from this university or any other institutions in India or abroad. Also, certified that this thesis was verified for plagiarism using the CUSAT library facility and found satisfactory. All the relevant corrections and modifications suggested by the experts during the pre-submission seminar and recommended by the Doctoral Committee are incorporated in the thesis.

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Declaration

I, Rama L. (Reg. No. 3912) hereby declare that the thesis titled **"The Role of Self-Esteem and General Self-Efficacy on Competence of Teachers in Engineering Colleges in Kerala"** is a bonafide research work submitted to the Cochin University of Science and Technology, Kochi, for the award of the degree of Doctor of Philosophy in Management under the faculty of Social Sciences done under the supervision of former Professor and Consultant Clinical Psychologist Dr. Sarada S. of the School of Management Studies, Cochin University of Science and Technology, Kochi. I further declare that this thesis is not previously used for the award of any degree, diploma, associate ship, fellowship or other similar title or recognition from this university or any other institutions in India or abroad.

Kochi 22 **Rama L**
May 2018

Dedicated to...

My Parents.....

Acknowledgement

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Rama L.

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Abbreviations

MOU	–	Memorandum of understanding
MANOVA	–	Multiple analysis of variance
OCB	–	Organization citizenship behavior
OBSE	–	Organization based self-esteem
AMOS	–	Analysis of moment structures
SPSS	–	Statistical package for social sciences.

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Chapter 1

INTRODUCTION

Contents

1.1 Introduction

In today's world, organizations adopt newer approaches to face competition and achieving business excellence. The economic system is characterized by speed, innovation, customer satisfaction and quality. Competitive advantage has shifted from tangible to intangible assets - an aspect that is applicable to educational institutions as well. Policy makers and researchers from a diverse range of countries such as the USA, Netherlands, Germany, UK, Australia and India are increasingly concerned with attracting competent and motivated people into the teaching profession to enhance competence of teachers leading to teaching excellence. It is therefore, not surprising that a growing body of research examines the underlined reasons for attracting people from other careers to teaching as also motivating them to become effective teachers.

In India, engineering education occupies a vital role in the higher education sector of the country. Studies show that from the period 1991-2008, enrolment in engineering education has increased from 2800 to about 28000 in southern Kerala. Since 2004, the out- turn rate of students in engineering education across branches showed decline - an aspect brought out after careful study in different branches of engineering colleges in southern Kerala.

Ensuring quality teaching in engineering discipline is one of the key areas of focus of the nation. However, effective teaching rests on the competence of teachers and understanding this to a great extent will, in turn, rests heavily on realising the multiple roles of teachers.

Today, there exists literature to support that teaching in engineering field faces a steady decline in terms of poor quality of teachers and students, out-dated syllabi and insufficient infrastructure such as inadequate laboratories and ill-equipped libraries.

In addition, low employability of engineering graduates portrays the reluctance of industries to select them to suitable positions which is a big concern in higher education.

The present study assumes significance on two crucial aspects. One teacher competence celebrates teachers' strengths and virtues. In particular, optimal class room functioning occurs when teachers believe in themselves, their students, and the importance of the content signifying that trait and attitude are important motivational variables in educational settings such as class rooms and laboratories. This is also true for exemplary performance of prospective teachers.

In this connection, it is important to measure the relationship among competence, self-esteem and general self-efficacy of teachers in engineering colleges. The sections that follow discuss these concepts. Subsequently, the focus of the current study and the organisation of the thesis are also explained.

1.2 Competence

Based on Webster's and the Oxford English dictionaries, "competence" is defined as a condition or quality of effectiveness, ability, sufficiency or success. Competence is an inherent psychological need of a human being. Competence relevant behaviours are not only motivated through positive but also negative incompetence. The researcher's aim is to see quality of teaching through the lens of competence. The study of competence is important from motivational point of view.

The operational definition of competence in this study is based on review of definitions of competence in the literature. It is "the abilities of the teacher in terms of subject knowledge, technical skills, evaluation of performance of students, updating academic programmes, designing curriculum, providing project guidance, administering laboratory tests and giving counselling for students".

1.3 General self-efficacy

General self-efficacy is defined as **"**the belief about one's ability to achieve goals and to overcome obstacles in daily living. It is viewed as a global construct and is drawn from the internal averaging of all success and failures that are attributed to the self."

General self-efficacy is defined as the capability of a person about self competence, the ability to achieve goals and to overcome obstacles in daily living.

The operational definition of general self-efficacy in this study is based on review of definitions of general self-efficacy in the literature. It is defined as "the belief in one's capability in oneself about teaching competence, the ability to achieve goals and to overcome obstacles in daily living. They evaluate their skills, capabilities and competence from past events that makes them face and succeed the existing challenges in the professional environment".

1.4 Self-esteem

Self-esteem is defined as "the disposition of experiencing oneself as competent in coping with the basic challenges of life and as being worthy of happiness".

The operational definition of self-esteem in this study is based on review of definitions of self-esteem in the literature. It is defined as the overall feeling of self-worth of the teachers. They evaluate their strengths, competence and confidence that drives and helps them to face and cope up with the challenging and demanding teacher situations in every day professional context.

1.5 Current Study

The current study attempts to examine the role of self-esteem and general self-efficacy on competence of teachers in engineering colleges in Kerala. It focuses on how self-esteem and general self-efficacy may

influence competence of teachers in engineering colleges to enable them with more understanding to enhance their competence for effective performance.

1.6 Organization of the thesis

Chapter 1 explains the concepts of competence, self-esteem and general self-efficacy.

Chapter 2 includes the review of literature on the variables competence, general self-efficacy, and self-esteem. It also explains the research gap and the conceptual model.

Chapter 3 contains the research methodology adopted in this study. It details the research design, population, sample and sample size. It specifies objectives, hypotheses, the operational definitions, tools used in data collection, reliability and validity scores, scope and significance and limitations of the study.

Chapter 4 includes descriptive statistics, reliability and validity scores, test of normality, Friedman rank test and t-test.

Chapter 5 includes structural equation modelling and the mediation analysis.

Chapter 6 contains summary of findings, discussion, contribution and conclusion of the research.

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Chapter 2

REVIEW OF LITERATURE ON COMPETENCE, GENERAL SELF-EFFICACY AND SELF-ESTEEM

Contents

2.1 Introduction

This chapter presents a detailed review of relevant literature on competence, general self-efficacy and self-esteem. Books, journals and research articles are reviewed to identify the research gap and evolve a theoretical framework to pursue the study.

2.2 Competence

Competence and competency are interchangeably used in research studies.

Eraut (1998) perceives "competency as a system of complex actions including the knowledge, abilities and attitudes required for the successful completion of tasks".

"The dynamic combination of knowledge, understanding and skills, something that can be demonstrated to a certain level of achievement along a continuum" is competence according to Gonz{'a}les, Julia and Wagenaar, (2005)

Rychen, Dominique S and Salganik, (2003) defined competence as "The ability to meet complex demands, by drawing on and mobilising psychosocial resources in context – i.e. a complex action system encompassing knowledge (also tacit); cognitive and practical skills; attitudes such as motivation, value orientations, emotions"

Competence has been defined by Epstein, Ronald M and Hundert, (2002) as the "habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served"

Competence also presumes integration of multiple competencies. Competencies are conceptualised as elements or components of competence, that is, discrete knowledge, skills, and attitudes (Kaslow, 2004).

According to **Woodruff (1991)** competence is defined as:

Knowledge: Information accumulated in a particular area of expertise. (e.g., teaching, accounting, selling, servicing, management)

Skills: The demonstration of expertise (e.g., the ability to make effective presentations or to negotiate successfully)

Motive: Thoughts driving behaviours (e.g., drive for achievement, affiliation)

Attitude: Self-concept, values and self-image

Traits: A general disposition to behave in certain ways (e.g., flexibility).

Competencies are defined as "dispositions in the area of knowledge, skills and attitudes which make it possible to perform work tasks at a desirable level (Filipowicz, 2004).

2.3 History and Development of Competence

In this context it is worthwhile to briefly sketch the history and development of competence.

2.3.1 Competency studies by David McClelland

The initial studies in the field of levels of competence and competencies were taken by David McClelland. He identified the competency variables that predicted job performance. He claims that competencies were not affected by race, gender or socioeconomic factors. His study claimed the performance attributes which are neither connected to workers knowledge or skill sets. McClellands competency methodology focused on two factors based on successful outcomes. The identification of successful factors between superior performers with less successful persons were compared and related to specific thoughts and behaviours underlying successful outcomes in that job context. Further he claims that there need not be a strong positive correlation between intelligence projecting good school grades and the levels of individual performance. Hence relating job performance to intelligence level and school grades cannot be validated. Socio-economic levels influence the individual's performance and competencies. There exists a strong relationship between individual competencies and business competencies at organisational levels.

A person may be more competent on a job but less competent on other job since the competencies differ across job and businesses. The proposed model by him put forward various competencies including personal, behaviour, knowledge, degree of special competence at different business case and tasks (David C McClelland, 1998).

2.3.2 Competency studies by Richard Boyatsiz

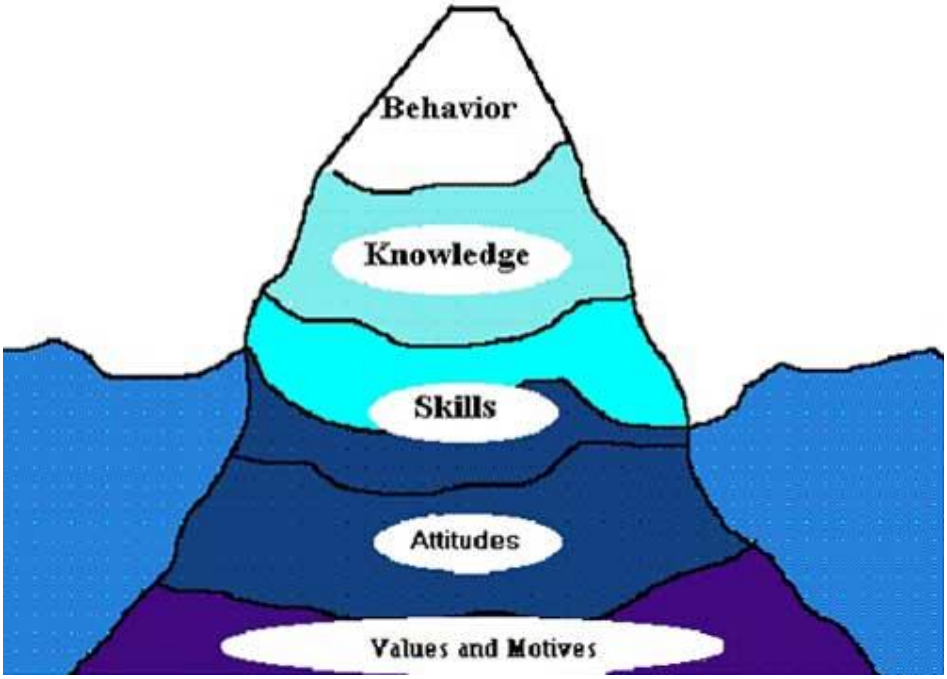
Richard Boyatzis claimed that the competencies are the key drivers for any organisation success. This competency study were propelled and gained popularity with the research work of Boyatzis. He claims that a person acquires knowledge and skill competencies while on job. Motives and social competencies contribute to job results or outputs. He defines work competency as "an underlying characteristic of a person which can be a motive, a trait, a skill which he or she uses. This definition describes competency to be a mixture of motivation, personal traits, skills, knowledge" (1982). The set of characteristics of a person defines the competencies which shape the behaviours. The behaviours describe the outcome with these underlying characteristic of a person such as motives, desires, feelings and thinking styles. Different behaviour indicators form different competencies.

2.3.3 Competency studies of L. M Spencer and S. M Spencer

L. M Spencer and S. M Spencer studied the structure of competence. The five types of competence characteristic is given by Spencer in the iceberg model. The competence is an individual underlying characteristic part of a person personality and can predict behaviour in a wide variety of situation and job tasks. The competence actually predicts who does something well or poorly as measured on a specific criterion or standard.

A competency is an underlying characteristic of an individual that is related to effective performance in a job or situation.

Competency: A person-related concept that refers to the dimension of behaviour lying behind competent performer.



The Iceberg Model of Competence Defined by Spencer L.M. JR. and Spencer S.M.

Source: Spencer, L. M. JR. & Spencer, S. M., Competence at Work: Model for Superior Performance, John Wiley & Sons, p.11, 1993.

Figure 2.1: Central and Surface Competencies-Iceberg Model

Competencies include the collection of success factors necessary for achieving important results in a specific job or work role in a particular organization. Success factors are combinations of knowledge, skills, and attributes (referred as "KSA's") those are described in terms of specific

behaviours, and are demonstrated by superior performers in those jobs or work roles.

Attributes include personal characteristics, traits, motives, values or ways of thinking that impact an individual's behaviour. Competence is a standard requirement for an individual to properly perform a specific job. It consists of knowledge, skills and behaviour used in such a way to improve performance. In general, competence is the state or quality of being adequately or well qualified, having the ability to perform a specific role. Management competency includes the traits of systems thinking and emotional intelligence, and skills in influence and negotiation. A person possesses a competence as long as the skills, abilities, and knowledge that constitute that competence are a part of them, enabling the person to perform effective action within a certain workplace environment. (Sepencer, LM and Spencer, 1993)

The competencies have five characteristics, they are

Motives: Things a person consistently thinks about or wants that cause action, motives drive, direct and select behaviour towards certain actions.

Traits: Physical characteristics and consistent responses to situations.

Self Concept: A person's attitude value or self image.

Knowledge: Information a person has in a specific work area

Skill: is the ability to perform certain mental or physical tasks.

The competence causes or predicts behaviour and performance.

2.3.4 Competency studies of David Dubois

Competence is the employees' capacity to meet the job's requirements. The produced job output should match the standards at an expected level of quality standards of the organisation's internal and external environments. Dubois, (1993) states that "a job competency is an underlying characteristic of an employee like motive, trait, and skill aspects of one's self-image, social role or a body of knowledge which results in effective or superior job performance.

2.3.5 Competency studies of Klein

Klein, (1996) defined competency very differently from other contemporary researchers. He suggested that competencies are a collection of observable behaviours or behavioural indicators. He further states that the behaviour underlie the competency.

2.3.6 Competency studies of Woodruff

Woodruffe, (1993) was the first one to distinguish competence and competency. He proposed that competence is a performance criterion and competencies are the behaviours driving competence. The basic requirement to perform a job is competence. Competencies are the knowledge, skills and attitudes that distinguish superior performers from average performers.

2.3.7 Competency studies of Robert A. Roe

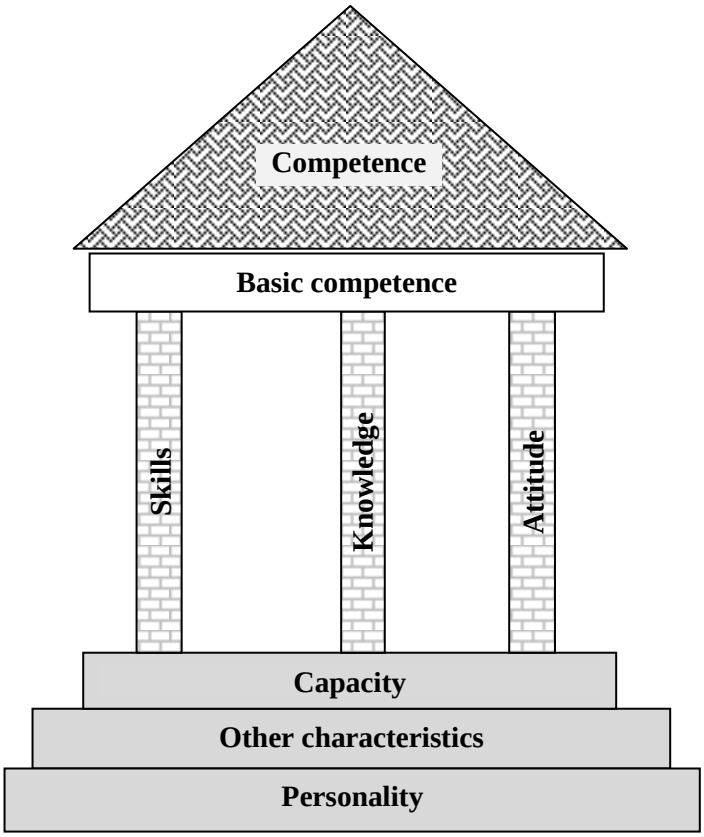


Figure 2.2: Robert A. Roe Architectural model of competence

Roe, (2005) defined competence as "the required ability to adequately perform a task mission or role". The sub competences in this model are knowledge, skills and attitudes. The fundamental competencies are capacity, personality and other characteristics. Competences are made up of skills, knowledge, attitude and basic competence. Knowledge is created through learning process. Apart from the individual characteristics, personality and capacity are also inputs of competence. Competence

model refers to all relevant competences required for the role of a particular job.

The first author to frame competence models was McLagan, (1980). She had explained the requirement of competence for planning human resource management.

2.4 Teacher Competence

It is very beneficial to distinguish between teaching competence and teacher competences. Teaching competence includes the activities and behaviours which is focused on the role of a teacher in the context of classroom environment (Hagger, Hazel and McIntyre, 2006). Teacher competences include a broader view of teacher professionalism and teacher plays a multifaceted role at all spheres of the school internal and external community.

In the field of education there is always a direct link between teacher competence and student performance. There exist two distinct meaning of competence. The view from theory competence is understood as a cognitive structure that facilitates specified behaviours. From an operational point of view, competence covers a broad range of skills that gives the ability to deal with complex, unpredictable situations. This operational definition includes "knowledge, skills, attitudes, meta cognition and strategic thinking and presupposes conscious and intentional decision making (Westera, 2001).

2.5 Westera's Competence Model

In the figure 2.1, Westera (2001) gives a schematic view of operational definition of competence.

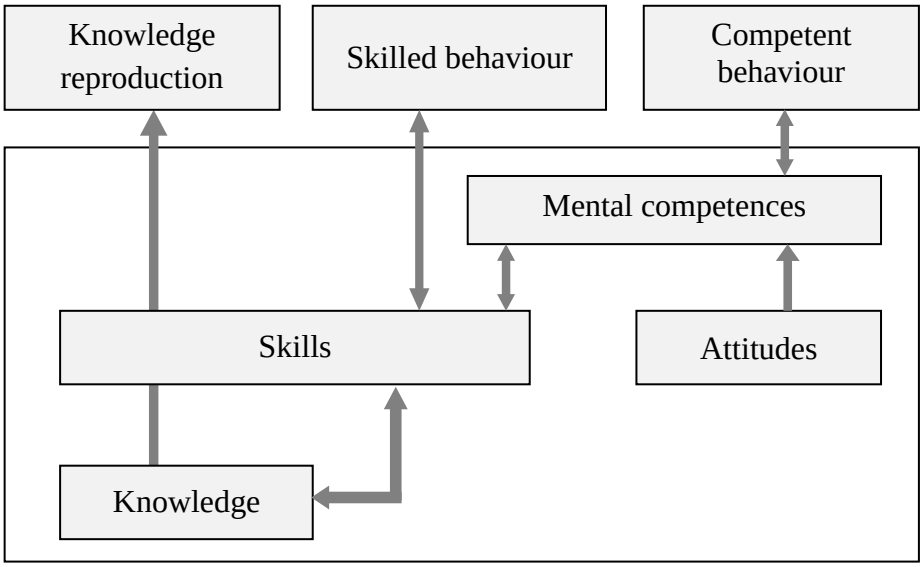
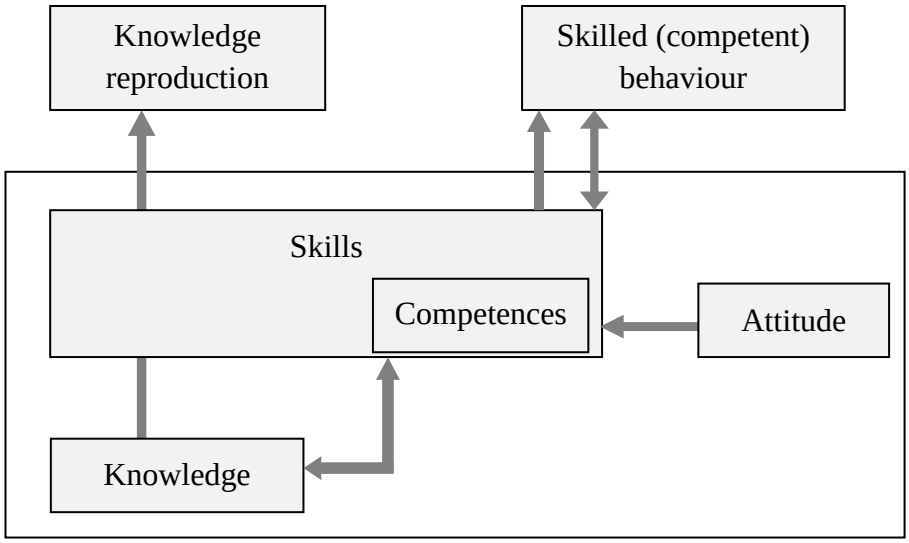


Figure 2.3: Westera, (2001) - A competence model

According to Westera (2001), operational competence can be explained as: "An individual's cognitive structures contain considerable theoretical and practical knowledge. This knowledge can be made available to the outside world by way of reproductive skills (i.e. speech, writing, pointing, etc.), or can become supportive to skills and the associated behaviours". Furthermore the author supports that in a complex non standard situation competences combine knowledge, skills and specific attitudes. Competences have two components one is mental component and the other is behavioural component leading to competent performance. The author explains competence to be a complex phenomenon. Competence may be further divided into sub components leading to sub-competences.

2.5.1 Competence as sub-skills



Source: Westera 2001, p86

Figure 2.4: Westera's model - Competences as sub-skills

Many authors have described competence as an action, outcome which can be demonstrated, observed and assessed. According to Tomlinson, (1995) "Competence or skill signifies a more or less consistent ability to realise particular sorts of purpose to achieve desired outcomes".

The concept of Westera (2001), is connected with the ability to master complex situations, and penetrates the levels of knowledge and skills to demonstrate how knowledge and skills are applied in a superior competent manner.

In a broader sense competence is a highly accepted quality which displays and propagates effective performances when properly used. In a complex situation competence demonstrates well more than simple

contexts. The abilities of an individual get noticed and displayed in a complex situation there by producing effective outcomes through efficient use of knowledge, skill and attitudes in appropriate situations (Westera, 2001). From the above discussions one can easily adapt this model and superimpose to teacher competence context for any levels of teaching.

2.6 Major Studies in Competence

Competence was first introduced and assessed by McClelland in 1970s, competences, or individual characteristics, are identified as predictors of employee successful performance Equal importance was given for individual's academic aptitude, knowledge and skill content (McClelland, 1973, Schley, D. G., Lucia, A. D., & Lepsinger, 1999).

A competence is a capability of applying knowledge, skills, abilities, behaviours, and personal characteristics to successfully perform critical work task, specific functions, or operate in a given role or position. Personal characteristic may be mental/ intellectual/ cognitive/ social/ emotional/ attitudinal, and physical and psychomotor attributes necessary to perform the job (Boyatzis, 1982; Dubois, 1993; Schley, D. G., Lucia, A. D., & Lepsinger, 1999).

Boyatis (1982) and Fogg (1999) included both internal and external constraints, environments and relationships related to occupation. In short competences are specific personal qualities that are "causally relates to effective / superior performance" (Boyatis 1982).

According to the authors Verma, Sarita and Paterson, Margo and Medves, (2006) "competencies in education create an environment that fosters empowerment, accountability, and performance evaluation, which is consistent and equitable. The acquisition of competencies can be through talent, experience, or training."

Barr (1998) gives the following examples of collaborative competencies: "Describe one's roles and responsibilities clearly to other professions. Recognize and observe the constraints of one's role, responsibilities and competence, yet perceive needs in a wider framework. Recognize and respect the roles, responsibilities and competence of other professions in relation to one's own. Work with other professions to effect change and resolve conflict in the provision of care and treatment. Work with others to assess, plan, provide and review care for individual patients. Tolerate differences understandings and shortcomings in other professions. Facilitate inter professional case conferences, team meetings".

Deci & Ryan (2000) argued that human motivation based on self-determination theory (SDT) requires considerable amount of innate psychological studies SDT emphasize specific psychological conditions for growth, integrity and well- being. This study leads to the findings that different goal contents have different relations to the quality of behaviour and mental health, specifically because different regulatory processes and different goal contents are associated with differing degrees of need satisfaction and there by associated with underlying goal pursuits which are differentially associated with effective functioning and well-being. This study also discusses the relation of the psycho- logical needs to

cultural values, evolutionary processes, and other contemporary motivation theories. Hence this study links need theories with competence to achieve goals and there by fostering psychological well being.

In a study conducted by Brown & Union (1975) about the perceptions of elementary, secondary and mentally retarded students on the competency and interpersonal skill characteristics of teachers within their teacher subgroups and toward the other two subgroups were measured and analysed This was assessed using a semantic differential instrument. Samples of one hundred thirty five teachers were included in the study. The two factor analysis of variance revealed that the teachers of mentally retarded students and teachers of elementary students were rated better than secondary teachers on the competency and interpersonal aspects of the study. This study brought out the relative low ratings of secondary teachers emphasized the need of for school psychologists to check and upgrade the professional self esteem of the teachers group. This links the teacher competence with self esteem in order to attain the goals in the professional set up.

Grace Sarah (2016) investigated the fundamental skills and competencies required for students to meet the demands of the market in the context of Unites states. These jobs demand an increasing use of cognitive and socio-emotional labour market competence skills to succeed in the competitive market. This study include a large sample of three thousand teachers from public school districts designed to evaluate the reliability and validity of performance measures used to assess teachers' effectiveness in this study the term social-emotional competence

captures the cognitive, affective and behavioural abilities which are generally not captures in other studies, which are not captured by standardised tests. To prepare students to meet the growing demands of the labour market not only calls for realignment of incentives of the teachers but also poses challenges in building teacher competencies to build capacities in students. The teacher training programs provides very little support in building pedagogical skills and develops competencies for teachers. This is a challenge but yet a substantial investment providing a bright future to students and economy.

In this study Admiraal, Hoeksma, van de Kamp, & van Duin, (2011) captured the videos of teachers of post graduate teacher education students to validate their teacher competence in Netherlands. The collection of data used mixed methods with interviews, videotaping and think a loud sessions sharing the feedback on the teaching classroom recorded from both teacher educators and student teachers. This study ensures the level of competence achieved by aspiring student teacher through discussion and refinement process.

This study is conducted in high achieving schools in United States among mathematics teachers in a cross cultural set up. This study by Ahuja (2007) ended up revealing the global strategies, conceptions, and patterns of effective mathematics teaching in class room settings. Also revealed and emphasised the Indian system of teaching practices of mathematics and imparting methods to students. The features of effective Indian system teaching methods were highlighted. The study found that those teachers with multicultural competence were more effective in

imparting mathematics to the diverse base of students who come from different academic and cultural backgrounds

This research by Alainati, Alshawi, & Al-karaghouli (2010) emphasised the importance of education and training in enhancing individual's competence, which in turn enhances the organisational competence. The paper addressed the issue of effect of education and training on individuals. Finally after investigation it concluded that education and training have to be implemented properly so as to obtain competent individuals to establish a competent organisation. The study approached the issue through a comparative method of investigation.

This interesting interrogation by McClelland (1973) questions the validity of intelligence test that are conducted for selection of jobs. The researcher argues whether these intelligent tests capture capabilities that lead to job success? Do the traditional exam scores alone measure all the required capabilities that are required for a superior performance in any job? The situations of various life outcomes needs scrutiny and examination for exemplary job performance, moreover the competence required for a particular job should be checked for success in that job. The study puts forward to look for better competence assessment measurement techniques such as communicative, emotional intelligence and cultural competencies to succeed in a job.

This study by Kagaari & Munene, (2007) established the relationship between the competencies of engineering lecturers and organisation citizenship behaviour. The study had used both qualitative and quantitative approaches. Firstly using interviews key result areas identified and then

competencies on those seven key areas were studied. The sample consisted of one hundred ten engineering lecturers at Kyambogo University. The study revealed that competent lecturers who exhibit the relevant competencies do exhibit OCB behaviours at work. The model derived employee competencies and critical outputs. The paper also advocated an approach to competency profiling, the need for engineering college lecturers which is the need of the hour.

This paper addressed the quality issues in the framework of higher education sector of china. Based on the working activities of the lecturers in the application oriented universities, the research focused on the competency elements of the lecturers to develop a competency model. It further proposes the outcomes to have application in recruitment and selection, development of teaching staff, in the training of teachers and to develop in service programs for lecturers. In this study displayed a competency model for the application-oriented university teachers. The competency elements are educative competency, personal quality, research and development competency and collaborative competency (Qiuyan & Qin, 2005).

The core competence in the organisational set up is the driving force for a strategic change, which kindles interest for scholars and managers to investigate about the complexity and challenges posed by the market forces. The study conducted by Bani-Hani & AlHawary (2009) investigated the effect of core competencies on competitive advantage. This is examined in 18 insurance companies from Jordan. The sample consisted of 61 questionnaires administered to the heads of insurance

companies. It was found that the statistical analysis showed significant positive correlation between core competencies and competitive advantage. The study also revealed that the core competencies had a significant impact on competitive advantage.

The study focused on the obtained competencies at university with that of the expected outcomes of the university education system. This research by Peklaj (2005) found that the curriculum change had to take place to match the expected outcome competencies from the course. The sample consisted of two hundred sixty three teachers from Maribor from different faculties of education. The study revealed a large gap between the obtained teacher competencies during pre-service program and the desired competencies on the domain of life-long learning and classroom management and communication.

This paper by Jans & Awouters (2009) addressed the specific competencies required for teachers in secondary and higher education sector in using information and communication technology (ICT) in teaching and learning process. The study put forward that a longer course is required to acquire ICT competence, moreover it commands to have didactic than technical proficiency. To realise the e-learning competences the study sets up an e-learning postgraduate course with four modules Pedagogical module, Technical module, Communication module and project module.

A study from Hong Kong conceptualized teacher competence as success or effectiveness. Teacher competence depends on the personal attributes a teacher possess and the professional qualities in the context.

The onion model by (Dilts R, 1990) is discussed in the study where competencies emerge from beliefs leading to the behaviour which interacts with the environment.

Interviews were conducted from 15 awardees teachers and recorded for interpretation by Elizabeth, May & Chee (2008). The findings revealed the qualities of competent teachers into two categories as personal qualities and professional qualities.

Competency mapping is used to determine the crucial elements and activities of an organisation. This paper by R.Yuvaraj, (2011) mentioned some useful benefits of competency modelling for the employees of the organisation. Competency mapping identified the skill and job behaviours required for superior performance. The author differentiated competence and competency very clearly. Competency is defined as how a job has to be done excellently and competence explains on what has to be done in a job but not how. Further the article mentiond about the core competency of an organisation which is the pillar of any organisation and impossible to copy or inject into another organisation.

This research article by Sa'ari, Luan & Roslan (2005) intended to measure the teachers' attitudes and competency in the subject of information technology. The article addressed the difference between competent and incompetent teachers in the purview of attitudes towards Information technology. The paper established positive attitude of teachers towards information technology. The paper also drew that teachers possess moderate level of information technology competence. The author still probed into and found that teachers lack appropriate information technology

competencies to integrate the technology into teaching learning process. The finding from MANOVA proves that there are significant difference between the competent and incompetent teachers groups in the areas of usefulness, confidence, anxiety and aversion towards the use of information technology in the teaching and learning process.

This article involved three hundred nine teachers from secondary and primary schools in Johor Bahru Malaysia. This study established the relationship between teaching competency and dominant characteristics of school teachers. The teacher competencies are identified through teaching skills, concern for school, concern for students and concern for self. This comprehensive and practical model of teachers' competency characteristics standards furnishes a competency model for school teachers. The study explored that teachers have to improve their competence levels in the key areas of subject knowledge, teaching abilities, classroom management skills, instructional planning of modules, collegiality, concern on schools, concern on students and concern on the self to enable themselves to become competent teachers (Hamdan, Ghafar, & Li, 2010).

This paper by Nadeem (2011) main objective is to find out the factors affecting female teachers' performance in Bahawalpur southern Punjab. The sample consisted of 203 female teachers from 30 secondary and senior secondary schools in Punjab. The study concluded that poor salary, over workload, bad conditions of school building, lack of library facility, lack of learning and teaching materials, status of teacher, respect in society, professional attitude of teachers, mental health, teachers' morale, responsibilities at home, distance of residing area, stress, political

interference, posting in the far flung areas, discrimination, lack of co-operation, working relations with staff and head teacher, working environment are the factors which affect the competencies of teachers negatively.

Competency based management has become an effective human resource tool for a successful function of any organisation. In this study educational institutions also require competency based management system implemented for its superior performance. In this study the author explored a new tool for the assessment and quality enhancement in the academic set up. This paper assessed the faculty members in academic setting using Personality, Ability, Knowledge and skills (PAKS) model. This study related this competence management system using one of the artificial intelligence tool, the expert system to bring transparency in the self appraisal and performance appraisal of the faculty member (Tripathi, Ranjan, & Pandeya, 2010).

This is an empirical study by Tripathi & Suri (2010) with the main objective of identifying the competencies of the faculty members of the educational institutions. This paper also developed a competency model for faculty members by integrating the job functions and the required competencies. For survival and growth educational institutions have to focus in enriching their competencies especially the quality of faculty members. The first phase of the study identified the key parameters and through statistical techniques identifies the pattern in their performances Author provides a base for the competency model for the faculty members.

This study by Chang Chen Su (2010) Checked whether case study method of teaching enhance students' learning, learning achievement and problem solving attitude. This study is conducted on human resource management unit of business program students in a four year technical university. This quasi experiment method concluded showing that the case study method can enhance learning achievement but failed to improve problem-solving attitude in students.

The study by Saeed (2009) aimed to evaluate the competences of secondary school teachers in Punjab in relation with classroom management skills. The samples collected from forty secondary schools, twenty from urban and twenty from rural districts of Punjab. The survey was done with teachers and students on classroom management skills of teachers. The majority of the students accepted that teachers are on time to class, well prepared, encourages the students to be self-directive and creates a good learning environment. The findings showed that majority of the heads, teachers and students accepted that teachers deal with students in a non- psychological way the study is conducted to identify the essential competencies of student teachers in teaching learning process.

The sample included ninety eight student teachers from B.Ed. Programme from Ranchi. Out of sixty five teacher competencies identified twenty two items were personal competencies and twenty three professional competencies. The teaching style, decision making skills, knowledge of psychological principles, teacher as a guiding force for students and experience in any profession is also treated as an asset for student teachers to become competent teachers (Bhargava & Pathy, 2011).

This study addressed the teacher competencies required for a virtual teaching and learning environment. The main aim of the study is to identify the achievements and difficulties in a designed specific environment. The paper explored the possible training proposals required for the teachers in connection with virtual teaching learning environment (Guasch, Alvarez, & Espasa, 2010).

This study is a descriptive research that described the socio cultural and environment problems affecting teacher competencies in the professional set up. This study measured the teacher competency in relation with students. The result showed professional jealousy and domestic work affect the professional competency of teachers (Khatoon, Azeem, & Akhtar, 2011).

This research article by Selvi (2010) discussed the general framework of teachers' competencies. The nine dimensions are field, research, curriculum, lifelong learning, socio-cultural, emotional. Communication, information and communication and environmental competencies of teachers' are discussed in this study. The paper concluded that teachers' competencies almost affect all the dimensions mentioned above hence, discussed to improve the teaching-learning process in the academic set up.

This study is conducted to assess the content related validity and construct related validity of a teaching evaluation form examined by nine hundred and twelve students on teachers' characteristics that contribute for effective college teachers. This is conducted using a multistage mixed analysis on college teachers by undergraduate and graduate students from public university. The result reflected in the development of effective

college teaching themes such as communicator, advocate, responsible, empowering, responsive, enthusiast, student-centred, professional, expert, connector, transmitter, ethical and director with thirteen themes altogether (Onwuegbuzie et al., 2007).

This paper brought to light the growing concern for teacher well-being and competence. The aim of this study is to examine the relationship between self perceived competence in daily work and self reported burnout. A random sample technique was designed to extract data from 500 teachers from government schools. The findings of the study related and holds for teacher training sessions ,well-being and competence of teachers (Pillay, Goddard, & Wilss, 2005).

This study investigated by Kulkarni, (2011) deals with the relationship between teacher competence and attitude towards teaching on B.Ed. teachers working in primary schools. A sample of hundred teachers working in primary schools those graduate and post graduate qualifications were considered for the study. The result revealed that there exist significant positive relationship between teacher competence and attitude towards teaching of male, female, rural, urban, arts, science, graduate and post graduate B.Ed. trained teachers.

The main purpose of this study by Wen & Shih (2008) was to establish a set of information competence standards which can be used for assessing and improving the ability and skill of school teachers in using the information technology for educating students at elementary and high school levels. This study employed expert round- table discussions and Delphi techniques to extract data from the respondents. This examined the

relation between information literacy standards and attitude towards using it for teaching learning process.

The study investigated the areas of expertise that make up a competent teacher. A principal component analysis was done to identify the areas of competence from a sample of three hundred seventy teachers and teacher educators from Serbia. The author identifies the related competences as values and child-rearing, understanding of education system and contribution to its development, subject knowledge, pedagogy and curriculum and self- evaluation and professional development. Teachers perceived the second and fourth areas to be more important areas among the four competences (Pantić & Wubbels, 2010).

Teaching in these modern times required information and communication technology competence. Hence this paper aimed at teacher students' didactic competence in use of technology. This study concluded with the remark that to develop didactic competence in the use of technology, the teachers need more exposure to technology, highly skilled and motivated. The students may derive the insights of core didactic concepts (Sølvberg, Rismark, & Haaland, 2009).

This study aimed at improving the capacity of teachers and trainers to evaluate their performance by developing their competence. The study identifies Planning, communicating, managing and evaluating as the main four levels of competence dimensions. These set standards of knowledge, ability and skill empower teachers and drawn through collaborative process (Peacock & Rawson, 2001).

This investigation by Klaassen, (2002) draws attention on how teachers pedagogical competence and sensibility is been eroded. This further addressed the aspect of how pedagogy at work is not being discussed by them. The data revealed that teachers are fearful of correcting the moral issues in the school campus. Further revealed how teachers avoided situations involving dispute settlement, deal with inappropriate behaviour and decide moral dilemmas.

Tomlinson (1995) investigated the potential pitfalls in use of competence profiling for initial teacher training programmes. The study concluded suggesting appropriate adaptations of traditional profiling approaches for improvement. These competence profiling approach ideas are applied for school-based initial teacher training programmes.

The study described a model of teaching competence in teachers of medicine. Expert opinions were collected from eighteen experts to validate the instrument. The required data was collected from two thousand two hundred eighty one students and one hundred seven teachers in connection with the existing standards of medical teachers' performance assessment. The medical teachers competencies identified in the study are communication and evaluation, humanistic, discipline, psycho pedagogical, solving problems and application. The instrument developed identifies the strengths and weakness of medical teachers in imparting medical education to aspiring medical practitioners (Por, Flores-Hernández, Martínez-González, & Sánchez-Mendiola, 2011).

This study investigated the importance of competence for the performance of teaching, assessment of the teachers, and their evaluation

for further and future professional development and lifelong learning in a group of future preschool teachers. The dominant eight key competencies are to communicate in native language, ability to communicate at least one foreign language, ability for critical thinking, flexible and creative application of acquired knowledge and skill, ability to use information and communication technology in teaching, possessing thorough knowledge in all subjects, possessing knowledge in educational matters and curriculum and being responsible and committed in the profession are identified in this study. The factor analysis revealed the indicators used to determine the competence of contemporary teacher in the academic set up (Jovanova-Mitkovska & Hristovska, 2011).

Competence- based teacher education is the main focus of this research in Belgium. A set of future pre-school teachers are the sample for the study. Competence implementation programs are counter checked from the teacher trainers to validate the implementation of competences during internship, through the policy programme and planning, integration of theoretical and practical components and lack of implementation due to incapable teacher trainers (Struyven & De Meyst, 2010).

This paper by Venkatraman (2012) argued that teachers' competency building is not a one time learning process but a continuous lifelong learning activity. The teachers have to post check and evaluate their performance standards. Actually teachers are struggling to face the changing needs and demands of the academic situation. In order to perform superiorly in their roles they have to enrich their level of competence continuously. This paper presented the view of a qualitative

study conducted with ten senior teachers from various branches of engineering departments. The key areas of self-development to meet the requirement of the profession, self-study and reflection, training programmes, research and development and innovation, collaborative learning approach with the help of peer/experts/mentors and awareness of institutional, national and international goals of education are identified and discussed in this study

This is a qualitative study examined the relation among student teachers' professional learning experience in an international set up with language and cultural competences. The findings showed that teachers do benefit and enrich personal and intercultural competence in cross-cultural set up. This learning has improved and developed their professional competence (Tang & Choi, 2004).

This research study outlined that beginning teachers believe that teaching competence requires demonstration of thorough preparation, a sound knowledge base, effective classroom management, professional communication with a range of stakeholders, and an accurate sense of self-awareness in the role of teacher (Huntly, 2008).

This study used survey design with a random sample of one hundred fifty English teachers. The study revealed that most pupils' performance was poor due to the poor skills of teachers in lesson planning, lesson presentation and evaluation. Further the study recommends some improvements for the betterment of learning teaching process of English in school system (Bipoupout Jean Calvin & Nguefo Evelyn Chumba, 2011).

This paper established the basic professional competences such as educational, programme and communicative competences in teachers and non teachers group. The communication competences are identified with interaction involvement, conflict resolution style and team work attitudes. The study revealed that teachers do not possess the essential communicative competence and hence suggested that communicative competence programmes to be included at the initial and continually in professional domain of teachers (Helleve, 2003).

This research work investigated the effects of student feedback in developing teaching competence among student teachers. The study was conducted on ten student teachers on a pre and post test design. It proved to be effective in improving the general teaching competence of student-teachers (Chawla, 2011).

This paper investigated the possibility of teacher's competency training and development to include in the process of learning teaching process of 21st century. Emerging student engineers are to be equipped for the demanding challenging roles of 21st century. This as a result increases the GDP of the nation in the respective areas (Kiran, Madarvalli, & Chandulal, 2011).

In this study the author lists down the desirable and undesirable behaviours of model university teachers. The data has been collected from six hundred eighty six university students to draw a framework of university teacher's competence model. This paper listed the required competences for an effective teacher. They are moral and ethical competence, technical competence, scientific competence, acclaimed

teacher's competence, excellent teaching competence, role model competence, mature personality competence, critically thinking competence, communication competence and motivation competence (Blašková, Blaško, & Kucharčíková, 2014).

This study examined the need of core, general professional and special competencies that are essential for a technical university teacher. The human drive for knowledge is termed as the core competency. General professional competence includes professional knowledge and skills to undertake research projects. Further suggested that technical teacher need to develop their creative abilities, competence, personal qualities to face and manage the complex situation that arise in teaching learning process (LiliGourier, 2010).

This study by Rama L and Dr. Sarada S. (2017) aimed at examining the linkage among self esteem, general self-efficacy and competences of individuals. Attracting competent and motivated people into the organisation is challenging real concerns that make policy makers and researchers think from a diverse range of countries. Therefore, it is not surprising to observe that a growing body of research examines the underlying reasons for motivating individuals to become effective performers. This study proposes a conceptual model to identify relationship among the variables self-esteem, general self-efficacy and competences.

The study by Rama L and Dr. Sarada S. (2017) investigated the impact of self-esteem, general self-efficacy and certain personal variables on competence of professors who teach engineering subjects. The sample

consisted of seven hundred sixteen teachers (Assistant professor, Associate professor and Professor) selected randomly from the governmental and non-governmental Engineering institutions of Kerala. Rosenberg's self-esteem scale, Jerusalem, M., & Schwarzer, R. scale for general self-efficacy and Ninsima's scale for measuring engineering teacher's competence were administered to the teacher respondents. Results revealed that gender have significant effect on general self efficacy, marital status have significant effect on teacher competence, category of institution have significant effect on self-esteem.

From the motivational point of view the study of competence indicated ineffectiveness, inability, insufficiency and failures. Competence includes a precise meaning and is a very significant psychological concept. This psychological richness of competence holds as a core in human functioning. Competence seems everywhere in human's life and hence found to have a substantial impact on emotional well being and is evident in all cultures of human race (Elliot, A. J., & Dweck, 2013).

Tafarodi and William B. Swann have defined self-competence as "a generalized sense of one's own efficacy or power".

According to Boyatzis (1982) competence is "a capacity that exists in a person that leads to behaviour that meets the job demands within parameters of organizational environment, and that, in turn brings about desired results". This means that possession of competencies leads to effective performance. The competencies are measured in order to differentiate from effective performance and ineffective performance, through motivation, personality, self-image, attitudes, values, knowledge

and cognition or performance. In order to establish effective recruitment and selection, training and development, promotion, performance appraisal, remuneration management and career planning educational institutions may embark into competence management system.

Wangyi, D., & Ke, (2006) suggested that logical thinking, relationship establishment, achievement orientation, personal relationship, information retrieval, responsibility, creation and innovation as the competencies of college teachers.

The word competency or competence has no single definition in literature (Strebler, 1997). In literature the words competence, competencies and competency are simultaneously used.

Yiyuan, Z., & Jianhui (2006) have mentioned three categories of competence which they label as competencies of teachers in teaching career. They are professional competency which includes knowledge and skill; psychological competency which includes achievement orientation, initiation, adaptability, cooperation, work ethics and organization loyalty. Performance pattern competency includes influence, consultation and personal relationship.

Hence competence is defined as "the combination of knowledge, skills, attitudes, values and personal characteristics, empowering the teacher to act professionally and appropriately in a situation, deploying them in a coherent way" (Koster, Bob and Dengerink, 2008).

2.7 General Self-Efficacy

It is important in this research to understand the self perception of the teacher regarding his/her capabilities**.**

2.7.1 Theory of general self-efficacy

Self efficacy is defined as a quality that is effective in behaviours and individual's self judgment about himself regarding the capacity to organize necessary thing to carry out a performance and do it successfully (Bandura, 1997). Self efficacy has been explained as individual's expectations about himself regarding level of success when he faces a new situation (Tschannen-Moran, Megan and Hoy, 2001), student's level of success and ability to teach about positive behaviours occurring from behaviours (Kiremit, 2006).

Self-efficacy, defined as beliefs in one's capabilities to mobilize the motivation, cognitive resources and courses of action needed to meet given situational demands (Bandura 1997).

Bandura's (1997) social cognitive theory defines self-efficacy as "the belief in one's capabilities to organise and execute course of action required to produce given attainments."Bandura's social cognitive theory of personality is the base for self-efficacy which is believed that individuals are self organised, proactive, self reflective and self regulated rather than passively driven by environmental factors.

"The concept of general self-efficacy provides an important conceptual tool for viewing healthy functioning" (Shelton, 1990).

Mark Sherer in his theory of general self-efficacy defines the global nature of general self-efficacy. He has stated that general self-efficacy is the summation or average of the entire individual task efficacy. Sherer also has invented a self-efficacy scale which measures general self-efficacy expectancies in educational, vocational and social areas (Woodruff, S. L., & Cashman, 1993).

Both Bandura and Sherer have agreed upon one aspect that self - efficacy is viewed as a personality trait with relative stability, which predicts an individual's performance in specific situations. If the strength of general self-efficacy is recognised and measured, it can help a person's progress toward greater achievement. The concept of general self-efficacy presents a reasonable explanation for why some individuals have a more confident outlook toward life. The individuals are more determined to achieve the task completely even it is difficult (Shelton 1990).

Individuals with high general self-efficacy expectations try new experiences and continue the task. Once the individuals achieve success their future general self-efficacy beliefs rise to a higher level (Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, 1982).

The theory of general self-efficacy is still in the early stages of development and its potential has not been completely understood (Shelton 1990).

Self-efficacy refers to "one's judgments of one's capabilities to perform specific task in specific situation" (Bandura 1986). Individuals engage, continue in an activity, and exert more effort during the activity

only if they believe that they are able to succeed at the activity. As measured through cognitive ability the powerful predictor of competence is self-efficacy (Pajares, F.,1995), because self-efficacy judgments require skills, ability and efficacy judgments which are highly correlated. Bandura found that self-efficacy judgments crop up from four sources. They are experience, vicarious learning, verbal persuasion and physical cues. The basis of educational research on self-efficacy is formed through theses four sources.

Teacher's belief in influencing the behaviour of the student and academic achievement is defined as teacher self-efficacy. The poorly motivated student and special students are also benefitted by high self-efficacy teachers (Berman, 1977).

Gibson and Dembo has established that teachers with high sense of instruction efficacy believe that unmotivated and poor learners could also be taught with extra effort by applying appropriate techniques (Gibson, Sherri and Dembo, 1984).

One of the best attribute of an individual contributing to effectiveness is strong sense of self-efficacy beliefs. This is supported by many research studies (Ashton, P. T., Olejnik, S., Crocker, L., & McAuliffe, 1982).

Swars (2005) investigated elementary pre-service teachers and found teacher effectiveness strongly correlating with teacher self-efficacy.

There are important factors of self efficacy which explain the individuals functioning and activities. They are: (i) Person's behaviour, (ii) Personal factors (i.e., thoughts, beliefs etc.,) and (iii) environmental

conditions. These three factors mutually influence one another. According to Bandura it is triadic in nature and describes it as a reciprocal determinism.

Self-efficacy is "An expectation that one can successfully perform behaviour. This is influenced by one's past experiences and attribution of success to chance or skill" (Sherer, M.,&Adams, 1983).

2.7.2 Sources of self efficacy

Self-efficacy stems from four sources. They are

1) Mastery experience, which is personal experience of mastery of a task.
2) Vicarious experience that is, second hand experience gained through imitating a model. i.e, observing a peer doing a particular task.
3) Verbal persuasion, in which support and encouragement given to the individual by others.
4) Psychological state or emotional arousal which deals in controlling one's level of fatigue, stress and anxiety. The most direct and powerful source of self efficacy is personal experience of mastering a task by the individual (Bandura 1977).

Usher, Ellen L and Pajares, (2008) explored that even though mastery experiences are the powerful sources of self efficacy, the strength and effect of the sources vary across individual's background factors such as ethnicity, gender and academic ability with respect to academic domain.

According to Bandurs (1997) self- efficacy determines factors such as motivation, self regulation, attribution and emotion. It is a multidimensional construct. Many researchers stated self efficacy beliefs play a vital role in influencing task choice, effort, persistence, resilience and individual's achievement.

People do not have the overall sense of self-efficacy in all domains. It is domain specific and task specific. Therefore the general self efficacy which is pertinent in teacher's occupational setting is an individual's self evaluations of his or her capability to succeed in the teacher work settings, which is the focus of the current study.

2.7.3 The development of teacher self-efficacy

Self efficacy beliefs strongly influence process of thinking. It also influence thought patterns, emotions that are directed towards goal-directed actions in places where people can exercise control and get their goals achieved. Self- efficacy beliefs are future oriented. It is about the competence level of a person which a person expects exhibit in a situation. Self- efficacy beliefs are based on teacher's judgements of their verbal persuasion such as encouragement from other teachers and supervisors (verbal persuasion). The teacher models prove to be success or failure in the situation (vicarious experiences). Self-efficacy beliefs affect the degree of emotional and psychological enhancement as expected in teaching situations. These beliefs are specific to teaching contexts and hence teachers make perceptions about their competence, capabilities in the availability and requirements of a specific teaching situation (Tschannen-Moran, M., Hoy, A. W., & Hoy, 1998).

2.7.4 Self efficacy and other areas of study

It has been extensively studied by different researchers in different areas. The areas of study are physical activity (Sperber, Nina and Hall, Katherine S and Allen, Kelli and DeVellis, Brenda M and Lewis, Megan and Callahan, 2014)**,** health (Jerome, Gerald J and McAuley, 2013), behavioural therapy (Gallagher, Matthew W and Payne, Laura A and White, Kamila S and Shear, Katherine M and Woods, Scott W and Gorman, Jack M and Barlow, 2013), training proficiency (Martocchio, Joseph J., 1997), job performance (Stajkovic, A. D., & Luthans, 1998) and academic achievement (Parker, Philip David and Marsh, Herbert W and Ciarrochi, Joseph and Marshall, Sarah and Abduljabbar, 2013).

2.7.5 Comparison of general self efficacy and specific self efficacy

Self-efficacy defined as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood, R., & Bandura, 1989, p.408). Self-efficacy has been widely studied in organizational behaviour research (Bandura, 1997, Gist, M. E., & Mitchell, 1992, Stajkovic, A. D., & Luthans, 1998). Research has established that self-efficacy influences and predicts many other important work-related outcomes and job attitudes (Saks, 1995), training efficiency (Martocchio, Joseph J., 1997) and job performance and effectiveness (Stajkovic, A. D., & Luthans, 1998).

According to Social cognitive theory (Bandura, 1997, Bandura, 1986), self-efficacy beliefs base on three dimensions (1) level of magnitude i.e., particular level of task difficulty, (2) strength i.e., certainty of successfully performing a particular level of task difficulty and

(3) generality i.e., the extent to which magnitude and strength beliefs generalise across tasks and situations Recently researchers have started focussing more on trait -like general dimension of self-efficacy, termed as general self-efficacy.

2.7.6 Definitions of self-efficacy

"The belief about one's ability to achieve goals and to overcome obstacles in daily living" is defined as general self-efficacy. It is viewed as a global construct and is drawn from the internal averaging of all successes and failures that are attributed to the self (Shelton, 1990).

General self-efficacy is defined as "one's belief in one's overall competence to effect requisite performances across a wide variety of achievement situations" (Eden, in press) or as "individuals' perception of their ability to perform across a variety of different situations" (Judge, T. A., Erez, A., & Bono, 1998). Hence general self-efficacy identifies differences among individuals in their feeling to view themselves capable of meeting task demands in a broader range of contexts. Researchers (Judge, T. A., Locke, E. A., & Durham, 1997, Gardner, D. G., & Pierce, 1998) have identified that specific self efficacy is a motivational state and general self efficacy is a motivational trait. According to Eden both general self-efficacy and specific self-efficacy are beliefs about one's ability to achieve the desired outcomes but the construct differ in scope of application of the performance field. According to Eden (1988) general self-efficacy is more resistant to ephemeral influences than specific self-efficacy, general self-efficacy and specific self-efficacy share the same

antecedents such as actual experience, vicarious experience, verbal persuasion and psychological states (Bandura,1997). The most powerful antecedent of general self-efficacy is the bundle of previous experiences (Sherer, M., & Adams, 1983, Shelton, 1990). Shelton (1990) proposed that general self-efficacy evolves over one's life span as an aggregated and accumulated successes and failures across different domains. General self-efficacy spreads across different task domains.

Bandura (1997) stated Powerful mastery experiences that provide striking testimony to one's capacity to effect personal changes can also produce a *transformational restructuring of efficacy beliefs* that is manifested across diverse realms of functioning. Such personal triumphs serve as transforming experiences. What generalizes is the belief that one can mobilize whatever effort it takes to succeed in different undertakings. (p. 53)

General self-efficacy contributes to accumulated successes, persistent positive vicarious experiences, verbal persuasion and psychological states in an individual. According to Judge Et.al (1997), general self-efficacy relates to other self-evaluation constructs, including self-esteem, locus of control and neuroticism. Judge and colleagues have identified high correlations between GSE and self- esteem (Judge, T. A., Bono, J. A., & Locke, 2000).

Chen, Gully and Eden have established that general self-efficacy is positively associated to need achievement and conscientiousness other motivational traits (Chen, G., Gully, S.M., & Eden, 2001).

General self-efficacy positively influences specific self-efficacy across tasks and situations, especially to make an individual feel more efficacious across tasks and situations is the power and influence of general self-efficacy (Eden, 2001).

Bandura (1997) claimed that general self-efficacy measures "bear little or no relation either to efficacy beliefs related to particular activity domains [i.e., specific self-efficacy] or to behaviour" (Bandura, 1997).

2.7.7 High and Low general self- efficacy

General self-efficacy is the belief in one's competence to tackle novel tasks and to cope with adversity in a broad range of stressful or challenging encounters, as opposed to specific self-efficacy, which is constrained to a particular task at hand. This study based on social-cognitive theory of Bandura explores relations between general self-efficacy and the other psychological constructs from seven countries among eight thousand seven hundred ninety six respondents. A high positive association found between general self-efficacy and optimism, self-esteem and self-regulation. A negative association found between general self-efficacy and depression and anxiety (Aleksandra Luszczynska, Gutiérrez Doña, & Schwarzer, 2005).

In the recent years general self-efficacy has caught the attention of organisation behaviour in the field of psychology and personality research. General self-efficacy transfers the self efficacy judgements to tasks and activities (Albert Bandura & Adams, 1977). General self-efficacy refers to the global confidence in one's coping ability across a wide variety of situations (Schwarzer et al 1997).

General self-efficacy aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Scholz, Doña, Sud, & Schwarzer, 2002). In theory and research self efficacy makes a difference in how people feel, think, and act (Bandura, 1997).

If an individual feels a low sense of self-efficacy, then it is connected with depression, anxiety and helplessness. People with low self efficacy will also sense low self-esteem and hence low level of competence, pessimistic thoughts about their achievements and personal development. Highly efficacious individuals tend to select more challenging tasks and exhibit superior performance (Bandura 1997).

2.7.8 Teacher self-efficacy

One of the most important concepts regarding self-efficacy is teachers' self efficacy beliefs. Teachers' self efficacy beliefs is defined as teachers' perception of ability to affect students' performance and showing necessary behaviours to do their duty successfully Teachers' self efficacy belief increases students' motivation to learn, affects forming higher perception of personality and their efforts to teach, aims and level of demand changes depending on self efficacy belief (Tschannen-Moran, Megan and Hoy, 2001) .

The area of knowledge that the teacher should excel is classified into five main categories: field knowledge, programme knowledge, teaching knowledge, personal knowledge and school-environment knowledge (Shulman,1986). The competencies of teacher comprise knowledge, skill, attitude and values related to the field of domain to carry the teaching learning process successfully and efficiently.

Teachers high in self-efficacy spend more time on academic learning, provide more help for students, and give more praise for accomplishments (Gibson, Sherri and Dembo, 1984).

2.7.9 Measuring general self-efficacy

The general self-efficacy scale was developed by Matthias Jerusalem and Ralf Schwarzer in 1979.First this scale had 20 items. In 1981 it was reduced to 10 items and used in 28 languages. The internal consistency of this scale was between alpha value being equal to 0.75 and 0.91. It had helped to capture general self efficacy of respondents in many longitudinal studies and checked for the values of stability and reliability (Schwarzer, R and Jerusalem,Weinman, 1995**).**

2.7.10 Major studies in the area of self-efficacy

The study by Abele & Spurk, (2009) focused on objective and subjective career goals with occupational self efficacy. The objective goals are salary and status; the subjective goals are career and satisfaction. The sample consisted of seven hundred thirty four highly qualified full times employed individuals answered the questionnaire after their graduation. They were also made to answer after three years and seven years. The results showed that occupational self-efficacy measured at career entry had a positive impact on salary and status three years later and a positive impact on salary change and career satisfaction seven years later. It is well understood that occupational self-efficacy measured at career entry had a positive impact on salary and status three years later and a positive impact on salary change and career satisfaction seven years later. The research shows that socio-cognitive reasoning can be applied to

career-success research. Self-efficacy beliefs and personal occupational goals are subject to individual differences this can be treated through career counselling and training. Boosting occupational self-efficacy is generally useful.

Nikoopour, Amini, & Tajbakhsh (2011) conducted a study on Iranian teachers to establish a relationship between trait emotional intelligence and their self efficacy. The sample consisted of three hundred thirty six teachers. The correlation values showed significant relationship between trait emotional intelligence and self-efficacy. Hence self efficacy with competence and performance established a link which cannot be denied.

According to Farber B.A (1991) practitioners and scholars across the globe consider teaching profession as a highly stressful occupation.

Teachers are often disappointed with non-achieving students and feel accountable for students' success. This study by Friedman (2003) brought out the association between perceived self-efficacy and burn out among teachers, The operational definition of self-efficacy is three dimensional in this study, and they are tasks, relation and organisation. The three classroom task efficacy factors are instruction, discipline and control. The organisational factors are inclusion and influence. Three hundred twenty two self report questionnaires were collected from teachers. Twenty one schools were selected randomly out of one thousand five hundred schools in Israel. It was found that perceived sense of self-efficacy was inversely correlated with perceived burnout. Low sense of self-efficacy leads to high burnout. The correlations between burnout and

self-efficacy variables were statistically significant in the negative direction. This research threw light on the important link between self-efficacy and goal accomplishments in teachers in the classroom settings.

Job satisfaction and students' academic achievement are the determinants of teachers' self efficacy beliefs. Teachers' self-efficacy beliefs were examined as determinants of their job satisfaction. This study conducted by Caprara, Barbaranelli, Steca, & Malone, (2006) among two thousand teachers from seventy five Italian junior schools which adopted a stratified sampling technique. They were administered, self-report questionnaire to assess self efficacy and job satisfaction. The students' average final grades were collected for their academic achievement. Using Structural equation modelling conceptual model was established with teachers' personal efficacy beliefs, their job satisfaction and students' academic achievement. The interventions aimed to promote teacher's sense of competence to improve the morale of the school and enhance the quality of their outcomes. Further this study provided a theoretical framework in the field of social-cognitive theory by increasing teacher's competence to meet the continuous challenges of this profession.

This study explained Banduras principal sources of self-efficacy and how self-efficacy influences one's goals, learning and effort exerted on job and the risk taking in attempting a new or a difficult task. The implications of self-efficacy at the managerial and organisational levels are discussed (Bayramoğlu et al., 2013).

This study focused on the present level of teachers' motivation in comparison with their entry levels of motivation. The study considers the

indicators of teachers' sense of professional identity to be job satisfaction, occupational commitment, self-efficacy and change in level of motivation and relationship among them. The proposed model is tested using structural equation modelling. The sample consisted of one thousand twenty one Dutch teachers working in secondary education. The indicators are strongly influenced by classroom self- efficacy and relationship satisfaction (Canrinus, Helms-Lorenz, Beijaard, Buitink, & Hofman, 2012).

This investigated the joint effects of academic self-efficacy and stress on the academic performance of one hundred seven college fresh students from minority institutions. The study established the relationship between self-efficacy and stress and also the relative effect of self-efficacy and stress on outcomes. The proposed model is tested using a structural equation modelling. The outcome of the study showed academic self-efficacy being more robust and consistent predictor than stress of academic success (Zajacova, Lynch, & Espenshade, 2005).

The study was conducted on a sample of two thousand teachers in seventy five Italian junior schools. The study identifies teacher self-efficacy beliefs as the strong determinant of job satisfaction and students' academic achievement. A structural equation modelling explained the linkage of the concepts teachers' self efficacy beliefs ,job satisfaction and students' achievement (Caprara et al., 2006).

This study investigated the incremental and discriminant validity of the traits in psychology: self-esteem, neuroticism, locus of control and generalized self-efficacy. Meta-analytic results showed a strong linkage among the four traits (Judge, Erez, Bono, & Thoresen, 2002).

Cognitive activity is described as a stable individual difference in peoples' tendencies to engage in and enjoy cognitive activity and effort. This study checks the negative moderating effect of general self-efficacy on the relationship with cognition. The study collected one hundred forty four samples from U.S. college students. The statistical technique employed was regression analysis and also with the sub-group to establish the differences. This study demarked the difference between cognition and cognition effort (Pillai, Goldsmith, & Giebelhausen, 2011).

Self- efficacy beliefs influence any kind of performance. In this study self-efficacy mediated the restructuring activity of the school management based system. This acts as an important mediator in achieving change, reducing stress in an individual. This study established linkages between the attributes of restructuring school based events and school principals' self efficacy (Dimmock & Hattie, 1996).

Zibin Song & Chathoth, (2010) have studied the interaction effects of the general self- efficacy and the organizational socialization inventory on tourism and hospitality organisation success. The fresher were examined and found they perceived general job satisfaction and intension to return to their organization. The sample was from china included three hundred fifty two senior tourism and hospitality undergraduates from two institutions for higher education. The study explained its benefits on theoretical and practical aspects within the context of organizational socialization theory and general self-efficacy related cognitive career theory and core self-evaluation theory in tourism and hospitality sector.

This study examined the interaction effects of general self-efficacy and optimism among twenty two respondents from a masters' level group process course. Because of the small sample size bootstrapping was conducted to assess the stability of regression coefficients. Here optimism, general self-efficacy and member expectations of the group were predicted outcomes from the growth group process activity. The initial expectations of the group emerged from the level of general self-efficacy of the respondents (Lightsey Jr., 1997).

This study was based on a single case study design for investigation. The changes in teacher self-efficacy and professional development programmes were examined. The first thing was to measure the teachers' self-efficacy effects through professional development programmes. This was tested through pre-test and post-test experimental design, and then based on observation and focus group interviews. Thirty eight teachers were selected and observed by measuring the self-efficacy and professional development and the study analysed the impact of self-efficacy on professional development and classroom practices. Multivariate analysis of variance showed positive effect on all three self-beliefs, instruction based learning enriched the teachers knowledge and skill in teaching and project based learning facilitated the teachers performance (Bümen, 2009).

This is an investigation between Self-efficacy and emotions in teaching practices exhibiting competence. The sample included two hundred two primary teachers who completed their degree qualification. This study draws attention in shaping, enriching and increasing the professional self-efficacy of teachers by gaining a degree. An interactive

mixed method research design is been adopted in this study. Self efficacy is sourced through mastery of task but increased self confidence in teaching sessions. Teachers with more self efficacy were confident and felt more skilled in producing the expected results in teaching learning process (Williams, 2009).

The study investigated on intra-group conflict through the role of two self-efficacies, global and social among group members. This focused on individual and situational factors in conflict management. Sixty seven youth respondents belonging to volunteer community service in Israel were selected for the study. Social self-efficacy proved to be the predictor to manage intra-team conflicts by integrating brought them to constructive mode. In leading the team successfully, self-efficacy related to the individual levels play an important role in managing conflicts at team level (Helena Syna, 2005).

This study found the relationship between general self-efficacy and health-related quality of life. The seventh grade two hundred seventy nine children were assessed for general self-efficacy and health-related quality of life. The regression results showed a significant relationship between high general self-efficacy and high health-related quality of life. Boys showed more self-esteem mean scores than girls. Single-parent family children showed low scores on health-related quality of life than two-parent family children. The study concluded showing general self-efficacy should be a main source for high health-related quality of life for school children (Kvarme, Haraldstad, Helseth, Sørum, & Natvig, 2009).

This paper investigated the effects of training given by supervisors on trainee self-efficacy, motivation and overall training effectiveness. The study was longitudinal self-report measuring self-efficacy and training effectiveness in one hundred twenty six employees who attended a training programme on computer software and design. The data was collected from the respondents at the beginning, mid and end of the programme. The trainees' performance scores were measured with the help of test scores. The findings revealed that training motivation and self efficacy training had to take place prior training sessions to obtain the full benefit of the training programmes (Tai, 2006).

During a work simulation set up this investigation aimed at finding the effects of workload and general self-efficacy on affective task reaction. The objective of this study is to check the moderating effect of general efficacy on demand and control on task reactions. One hundred forty one respondents participated in the study with high and low workloads. When work load is low high efficacious individuals manage anxiety very well and low efficacious individuals worked well at high control conditions (Parker, Jimmieson, & Johnson, 2013).

This research is applied in a group of unemployed graduates which used general self-efficacy intervention technique. The study used quasi-experimental intervention technique using general self-efficacy. At the end of the intervention method using general self-efficacy participants showed high levels of self-efficacy. The results were discussed in the light of the programme design for recruitment and evaluation (Hazenberg, Seddon, & Denny, 2015).

This was a study confirming the validity of psychometric scale between general self-efficacy and social cognitive variables. This examined on one thousand thirty three respondents from three countries: Germany (six hundred thirty three), South Korea (nine hundred forty nine) and Poland (three hundred fifty nine). The respondents were dealing with stressful situations such as myocardial events or tumour surgery. The respondents ranged between sixteen and eighty six years by age. Perceived self-efficacy was measured by the general self-efficacy scale (R. Schwarzer & M. Jerusalem, 1995). The result showed consistent evidence for associations between perceived self-efficacy and the variables in the study confirming the validity of psychometric scale.

General self -efficacy represent a universal construct that relates meaningfully with other psychological constructs (Aleksandra Luszczynska et al., 2005).

This investigation was conducted on a cognitive-behavioural in school based primary prevention programmes for a sample of three hundred forty seven eighth-grade students in a controlled randomised trial for three months period. The results showed depression symptoms are low for students with strong social networks. The experiment showed high benefits for participants with low self-efficacy than high level self-efficacy candidates. Finally the prevention programmes had showed favourable effects on the group (Po"ssel, Baldus, Horn, Groen, & Hautzinger, 2000).

For a sample of adults with spinal injuries a programme on general self-efficacy was administered to facilitate their daily activities of living. Participants seventeen in number were exposed to a weight-training

instruction and general self-efficacy programme, and the other control group. Those participants exposed to both weight training and general self-efficacy sessions experienced greater level of generalisation self-efficacy than the other group which receive only weight training sessions (Wise, Ellis, & Trunneil, 2002).

This study aimed at finding the gender differences in perceived self-efficacy and academic performance in marketing, organisational behaviour, accounting, computing, Mathematics and statistics subjects. One hundred fifty four students in second year of business administration were examined for this study. The results showed that female students had significantly lower self-efficacy in computing and marketing and higher self-efficacy in statistics than male students. In general there was no significant gender differences in academic performance between male and female students except female students outperform in the subject of statistics (Busch, 1995).

This investigation linked general self-efficacy and social cognitive variables (intention, implementation intentions, outcome expectancies, and self-regulation), behaviour specific self-efficacy, health behaviour, well-being, and coping strategies among one thousand nine thirty three respondents in three countries: Germany (Six hundred thirty three), Poland (Three hundred fifty nine), and South Korea (Nine hundred forty one). The study showed general self-efficacy proved to be a universal construct that yields meaningful relations with other psychological construct (A. Luszczynska, Scholz, & Schwarzer, 2005).

The study by Alkan & Erdem, (2012) established positive medium relationship between teacher self efficacy and field competency of chemistry student teachers.

2.8 Self Esteem

2.8.1 Understanding Self-esteem

According to Blascovich, J., & Tomaka (1991) self-esteem refers to an individual's sense of his or her value or worth, or the extent to which a person values, approves of, appreciates, prizes, or likes him or herself. Branden points that "positive self-esteem is the immune system of the spirit, helping an individual face life problems and bounce back from adversity" (Branden, 1992).

"Self-esteem is how we value ourselves; it is how we perceive our value to the world and how valuable we think we are to others. Self-esteem affects our trust in others, our relationships, and our work – nearly every part of our lives. Positive self-esteem gives us the strength and flexibility to take charge of our lives and grow from our mistakes without the fear of rejection.

The outward signs of positive self-esteem:

- Confidence
- Self-direction
- Non-blaming behaviour
- An awareness of personal strengths
- An ability to make mistakes and learn from them
- An ability to accept mistakes from others

- Optimism
- An ability to solve problems
- An independent and cooperative attitude
- Feeling comfortable with a wide range of emotions
- An ability to trust others
- A good sense of personal limitations
- Good self-care
- The ability to say no

Low self-esteem is a debilitating condition that keeps individuals from realizing their full potential. A person feels unworthy, incapable, and incompetent to live if he possess low self-esteem. In fact, because the person with low self-esteem feels so poorly about him or herself, these feelings may actually cause the person's continued low self-esteem.

The signs of low self-esteem:

- Negative view of life
- Perfectionist attitude
- Mistrusting others – even those who show signs of affection
- Blaming behaviour
- Fear of taking risks
- Feelings of being unloved and unlovable
- Dependence – letting others make decisions
- Fear of being ridiculed" [1]

[1] www.ucdmc.ucdavis.edu/hr/hrdepts/asap/Documents/Self_esteem.pdf

Self-esteem can be defined as one's overall sense of self-competence and self-worth (Tafarodi, R. W., & Swann Jr, 1995). Self-esteem increases when the students succeed and become competent in academics but experience low self-esteem when faced with failures in academics (Niiya, Y., Crocker, J., & Bartmess, 2004).

Self-esteem influence the very idea of competence within the frame work in the study (Molden, D. C., & Dweck, 2000).

Walther & Radcliffe has critically investigated the perceptual gap between the graduate attributes that education system produce and competencies needed in practice in order to satisfy industry expectations. This empirical study includes the student's attitude and self-concept at the meta- level and contextualize the student's set of competencies to a specific work situation (Walther & Radcliffe, 2007).

Frank, Plunkett, & Otten (2010) has investigated on one hundred fifty eight Iranian American adolescents the results showed that positive self-esteem, self-deprecation, mother and father knowledge of psychological control were directly related to general self-efficacy. Further, general self-efficacy was found to be correlating with self-esteem in students.

Self-esteem influences achievement motivation and competence acquisition. Self-esteem is the need for self-respect, such as confidence, competence, achievement, mastery, independence, and freedom. Hence self-esteem is defined as "how we evaluate ourselves and our characteristics. It is the personal judgment of worthiness that is expressed in the attitude the individual holds toward himself" (Kohn, 1994).

2.8.2 History of Self- Esteem

Self- esteem is an essential component of good mental health. It is a concept widely used in psychology. It denotes an individual's sense of his or her value or worth or the extent to which a person values, approves of, appreciates, prizes or likes him or herself (Blascovich, J., & Tomaka, 1991b).

The very first definition of self-esteem was given by James in 1890 who perceived that self-esteem to be the ratio of success in important domains of life. In his conception of look glass self (Cooley, 1902) hypothesised that self views are the aggregation of information feedback from others.

The recent definitions of self-esteem clearly pinpoints that self-esteem should be distinguished from other components of the self concept such as self-knowledge and self- efficacy. Self-esteem is the affective or evaluative component of the self- concept. It implies how individuals feel about themselves (Leary, Mark R and Baumeister, 2000).

Self-esteem is defined as the favourable or unfavourable attitude toward the self. Self-esteem brings out a person's overall sense of self worth and beliefs about the self. High self-esteem is the important and fundamental aspect of personal well-being, happiness and adjustments. Individuals with high self-esteem shoe more satisfaction towards their lives, have less interpersonal problems, are more consistent and are less affected by psychological problems such as anxiety and depression and less affected by physical illness than the individuals with low self-esteem. Self-esteem also refers to the positive or negative way people feel about

themselves on the whole which is called as global self-esteem (Rosenberg, Morris and Pearlin, 1978).

Global self-esteem is defined as the overall positive or negative attitude towards the self. Positive evaluations evolve from individuals possessing high self-esteem. High self-esteem individuals accept themselves and found to be related to prevent such as depression (Avison, William R and McAlpine, 1992).

In other hand low global self-esteem has been associated with negative self evaluations exhibiting self doubts and self- rejections (Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, 2003).

Low global self esteem has predicted stress symptoms and ill health (Birndorf, Susan and Ryan, Sheryl and Auinger, Peggy and Aten, 2005).

2.8.3 Theories of self esteem

"Self-esteem reflects a person's overall subjective emotional evaluation of his or her own worth. It is a judgment of oneself as well as an attitude toward the self " (J. P. Hewitt, 2009).

Morris Rosenberg (1965) and Social-learning theorists defined self-esteem in terms of a stable sense of personal worth or worthiness, measurable by self report testing.

Nathaniel Branden (1992) defined self-esteem as "the disposition of experiencing oneself as competent in coping with the basic challenges of life and as being worthy of happiness". This two-factor approach provides a balanced definition that seems to be capable of dealing with limits of

defining Self-esteem primarily in terms of competence or worth alone. There are two components to Branden's definition: The first he calls self-efficacy: "Confidence in the functioning of my mind, in my ability to think, understand, learn, choose, and make decisions; confidence in my ability to understand the facts of reality that fall within the sphere of my interests and needs; self-trust, self-reliance". The second is self-respect: "Self-respect means assurance of my value; an affirmative attitude towards my right to live and be happy; comfort in appropriately asserting my thoughts, wants and needs; the feeling that joy and fulfilment are my natural birthright".

Branden's (1992) description of self esteem includes the following primary properties:

- Self-esteem as a human need for worthy existence.
- Self-esteem as an automatic and inevitable consequence of the sum of individuals' choices in using their consciousness.
- Something experienced as a part of, or background to, all of the individual's thoughts, feelings and actions.

In his famous book, 'The power of self-esteem' Nathaniel Branden (1992) remarks that "self-esteem is the experience that we appropriate to life and to the requirements of life. More specifically, self-esteem is:

1) Confidence in our ability to think and to cope with the basic challenges of life.
2) Confidence in our right to be happy, the feeling of being worthy, deserving, entitled to assert our needs and wants and to enjoy the fruits of our efforts".

According to Blascovich, J., & Tomaka, (1991) self-esteem refers to an individual's sense of his or her value or worth, or the extent to which a person values, approves of, appreciates, prizes, or likes him or herself. Branden points that "positive self-esteem is the immune system of the spirit, helping an individual face life problems and bounce back from adversity" (Branden, 1992).

"Self-esteem is how we value ourselves; it is how we perceive our value to the world and how valuable we think we are to others. Self-esteem affects our trust in others, our relationships, our work nearly every part of our lives. Positive self-esteem gives us the strength and flexibility to take charge of our lives and grow from our mistakes without the fear of rejection.

The outward signs of positive self-esteem are confidence, self-direction, non-blaming behaviour, an awareness of personal strengths, an ability to make mistakes and learn from them, an ability to accept mistakes from others, optimism, an ability to solve problems, an independent and cooperative attitude, feeling comfortable with a wide range of emotions, an ability to trust others, a good sense of personal limitations, good self-care, the ability to say no.

Low self-esteem is a debilitating condition that keeps individuals from realizing their full potential. A person feels unworthy, incapable, and incompetent to live if he possess low self-esteem. In fact, because the person with low self-esteem feels so poorly about him or herself, these feelings may actually cause the person's continued low self-esteem.

The signs of low self-esteem are negative view of life, perfectionist attitude, mistrusting others even those who show signs of affection, blaming behaviour, and fear of taking risks. Feelings of being unloved and unlovable, dependence-letting others make decisions, fear of being ridiculed"

Self esteem describes the sense of worthiness of people on how people think, feel and regard themselves. It describes the degree of worthy feeling they attach to themselves. Self esteem is always a component of success in any situation of life. Too little or too low self esteem leaves people with a defeated or depressed state of mind. This low self esteem leads people to make bad choices, fail to live up to their full potential. Too much or too high self esteem can certainly damage personal relationships. So self esteem at the extreme high and low ends of the spectrum can be damaging, so the ideal is to strike a balance for a safe play in situations of life. A positive view of the self esteem is considered ideal.

In psychology, self esteem describes a person's overall sense of self worth or personal value.

- Self esteem is seen as a personality trait hence it tends to be stable and enduring.
- Self esteem can include a variety of beliefs about the self, such as the appraisal of one's own appearance, beliefs, emotions and behaviours.
- Psychologists treat self esteem as an enduring personality characteristic (trait self esteem) but for short term variations (state self esteem) that occur[2].

[2] www.ucdmc.ucdavis.edu/hr/hrdepts/asap/Documents/Self_esteem.pdf

- Self esteem is all about how positively or negatively we feel about ourselves. It influences personal well being, happiness and adjustment (J. D. Brown, 1998, Diener, 2000).

Self esteem is treated as the evaluative component of the self concept, a broader representation of self that includes cognitive and behavioural aspects and also evaluative or affective ones (Blascovich & Tomaka 1991).

The important derivatives of self esteem are self acceptance, self love, a positive self image and the freedom to be ourselves. Nathaniel Branden (1992) says, "Healthy self esteem correlates with rationality, realism, intuitiveness, creativity, independence, flexibility, ability to manage changes, willingness to admit and correct mistakes, benevolence and cooperation. Poor self esteem correlates with irrationality, blindness to reality, rigidity, fear of the new and unfamiliar, inappropriate conformity or inappropriate rebelliousness, defensiveness, an overly complaining or controlling behaviour and fear of hostility towards others".

As of 2003, over twenty five thousand articles, chapters and books had been referred to self esteem. Self esteem is the third most frequently occurring concept in psychological literature. The Oxford dictionary traces the use of the term self esteem in English as far back as 1657. Self esteem has been treated as both trait variable (long term, affectively laden self evaluation) and a state variable (short term, situational, affectively laden self evaluation). It has been focussed and studied at global, organisation and task specific levels (Strauss, 2005).

The construct self esteem measures global sense of self esteem in most of the studies, concepts like self confidence or body esteem are used

to imply a sense of self esteem in more specific domains as the case may be. Self esteem functions as a trait variable and it is assumed to be stable across time and individuals. Self esteem is directly or indirectly related to every other psychological constructs or concepts due to its extreme popularity and applicability in almost all psychological studies. Self esteem is related to other psychological domains such as personality (e.g., shyness), behavioural (e.g., task performance), cognitive (e.g., attribution bias) and clinical concepts (e.g., anxiety and depression).

Self esteem is how we perceive and value ourselves and how valuable we think we are to others. It impacts our work, our relationships and trust in others. Positive self esteem adds strength and boosts us making flexible to changes and to grow from our mistakes without the fear of being rejected.

Branden, (1992) further stated to understand a person psychologically it is important to understand the nature and degree of self esteem the individual possess. According to Braden competence and worthiness are the two important aspects of self esteem. He also stated that self-esteem "is the conviction that one is competent to live and worthy of living" He stated that there are six pillars which form the foundation of self-esteem. They are

- The practice of living consciously
- The practice of self acceptance
- The practice of self responsibility
- The practice of self assertiveness
- The practice of living purposefully
- The practice of self integrity

"Self concept is what we think about the self and self esteem is the positive or negative evaluations of the self, as in how we feel about it" (Smith, Eliot R and Mackie, 2008).

The conceptualization of self esteem are figuring around three main areas (a) its dimensionality to be specific whether it is one-dimensional or multidimensional concept.(b) its stability whether self esteem is a stable personality trait or a state dependent on context (c) the level of conscious and unconscious process involved in making self-evaluations (Heatherton & Wyland, 2003).

Self-Esteem is "How we evaluate ourselves and our characteristics. It is the personal judgment of worthiness that is expressed in the attitude the individual holds toward himself" (Kohn, 1994).

2.8.4 Comparison between high and low self esteem

People with high self esteem tend to act and behave with confidence. They display and make use of strengths over their weaknesses. Teams and individuals with high self esteem always display high performance in any job setup. High self esteem out turns high performance hence the individuals are more satisfied and value themselves compared to low self esteemed individuals. Individuals who possess low self esteem tend to feel less confident. They focus on their weaknesses rather than their strengths. Individuals with low self esteem perceive themselves as failures and are more worried about others' view and thoughts about them. People with low self esteem cannot tolerate criticism and hence skip opportunity on constructive criticism (Weiss, 2001).

Low self esteem is associated for a higher need of social approval. Low self esteem is always concerned with the social evaluation by others (Vermunt, R., van Knippenberg, D., Van Knippenberg, B., & Blaauw, 2001).

People with high self esteem are more confident and hold better relationships with others, can be more successful in their lives. High self esteemed people are optimistic in their thoughts and actions. They can manage and overcome the struggles of life and lead others as well. They also cultivate a better parental relationship with their children.

Low self esteemed people are stressed with higher social anxiety, social membership, acceptance and reliance (Kundu, S. C., & Rani, 2007).

High self esteem is connected with many positive and successful outcomes in life. Individuals with high self esteem are more consistent in their behaviour and attitude hence they encounter with fewer interpersonal problems. Low self esteem cultivates stress, conflict, ambiguity, poor supervision, poor working conditions for employees in job environment (J. D. Brown, 1998).

High self esteemed people are less adaptive, in their behaviour, based on feedback or situation. Low self esteemed people are more responsive to external cues than high self esteemed individuals. Individuals with high self esteem are happier in life; they have less interpersonal problems, always feel worthy to contribute something meaningful to others. They establish satisfying love relationships and also everlasting ones in life with whom they encounter in life situations (Joel Brockner, 1988).

2.8.5 Measuring self esteem

Self esteem is measured by psychologists through a self report questionnaire which quantifies the qualitative aspects of self esteem. The very popular and widely used scale to measure self esteem is Rosenberg self esteem scale. It is an attempt to achieve a one-dimensional measure of global self esteem (Rosenberg, 1965).

Rosenberg's scale was originally developed to measure adolescents' global feelings of self worth or self acceptance. This is considered to be the standard measure against other scales of the time. It is a self report instrument for evaluating individual self esteem, investigated using item response theory. It includes ten items that are scored using five point responses ranging from one (strongly disagree) to five (strongly agree). The limitation of all measures of self esteem is their self report measure and it is difficult to obtain non self report measure of such a personal and subjective construct. The scores on most tests exhibit fairly high levels of self esteem.

Rosenberg (1965) clarified that self-esteem can be divided into global and specific self-esteem. He developed the Rosenberg self esteem inventory. Most of the studies in research measured self esteem using self-esteem inventory. In research self-esteem inventory is the most widely used inventory for self esteem (Demo, 1985). No studies in literature have questioned the validity and reliability of self esteem inventory.

Firstly self-esteem was criticised to be highly influenced by mood (Andrews, Bernice and Brown, 1993), highlighting that the self-esteem

measure may be captured as a state rather than a trait construct. Second, some researchers criticised that the instrument combines both positive and negative self-evaluations into a unitary measure, even though they are claimed to be independent concepts (Andrews, Bernice and Brown, 1993).

Another criticism is that self esteem inventory extracts positive and negative self-esteem scores. Self esteem measures the two independent factors. They are positive and negative responses from respondents rather than the aspects of self-esteem (Carmines, Edward G and Zeller, 1974).

2.8.6 Major studies in the area of self-esteem

Self-esteem scale measures more of positive self evaluations related to mood rather than the negative self esteem which is found to be more stable and more strongly viewed (Smith, Ben and Fowler, David G and Freeman, Daniel and Bebbington, Paul and Bashforth, Hannah and Garety, Philippa and Dunn, Graham and Kuipers, 2006). Self-esteem scale relies on self reports, conceptualise self esteem as a conscious process (Heatherton & Wyland, 2003).

There are various studies found in literature which links the concept of self esteem to motivation, performance, stress, workplace, outcome, happiness, mental well being, competence and leadership of individuals and teams in organizations.

This study related the linkages between self esteem and teacher competence. Only competent individuals result in superior work performance and job effectiveness. High level of self esteem always

relates to positive superior performance in the organization settings and vice versa (Korman, 1970).

Individuals who are more adaptive to the situational needs behave according to the feedbacks of the work setup, possess low self esteem. These individuals think and feel what others think about them (J. Brockner, 1988).

Researchers had established mixed results supporting direct and indirect relationships between self esteem and job performance (Carson, K. D., Carson, P. P., Lanford, H., & Roe, 1997, Strauss, 2005,Erez, A., & Judge, 2001,Gardner, D. G., & Pierce, 1998).

The survey results of forty studies were collated by Judge and Bono which consisted of five thousand participants established a weak positive relationship between self esteem and performance (Bono, J. E., & Judge, 2003).

Individuals who score on low self esteem always depend on others approving them on the positive note. They are more influenced by external fluctuations, low degree of interpersonal relationships. The most important research finding is that the low self esteemed individuals can be trained to reach the high score on self esteem in their lives, so that they are benefitted to enhance their self concept through training interventions (Robbins, 2001).

Johnson, R. E., & Chang (2006) have studied the linkage of employees self concept very crucial self regulatory mechanism with that of organisation commitment outcomes. The study showed significant

difference with the unique association between collective self concept and affective commitment in the context of shared group orientation and internationalisation of collective goals and norms.

Self concept, a wider idea of self esteem, behaved as a moderating variable the relationship between commitment and organisation citizenship behaviours (OCB). This study resulted in a stronger relationship between affective commitment and OCB for individuals with high collective levels of self concept. In a longitudinal study in an academic setup, Waddell (2006) came up with the evidence of individuals with low self esteem in cohort of high school graduates are significant predictors of outcomes such as job characteristics, on the job activities, degree of supervision and work. The change occured when interventions are subjected in terms of boosting positive attitude and self esteem in them (Waddell, 2006).

This study explored association of self esteem with selective memory. Self esteem is identified in terms of two sub components, self competence and self liking. Out of the three studies conducted, study one and study two, self liking independent of self competence was found to be negatively associated with memory for traits conveyed lack of social worth. In study three, self liking independent of self concept has also shown a negative association with memory in connection with failure related content. Greater self esteem appeared to enhance the strength and efficiency in retrieving memory traces in future (Tafarodi, Marshall, & Milne, 2003).

Employee motivation was one area where organisation based conceptualisation of self esteem is studied and viewed by Pierce, J. L., & Gardner, (2004). The study included the components of organisational structure, worthy feeling about their organisation, success outcomes and rebuilding role conditions based on self esteem. Self esteem based on organisation is related to turnover intentions, psychological contract, quality of work life balance, job satisfactions, organisation citizenship behaviour, and organisation commitment, motivation in role performance, attitude and behaviours.

In a study investigated by Crocker, J., & Park (2004) the importance of self esteem has been highlighted. No matter whether self esteem is high or low, but self esteem lies in when people strive more of it. Generally people think in terms of validating their abilities and qualities and hence their self worth. People react to threats such as undermine learning, relatedness, autonomy, self regulation and overtime, mental and physical health, when they fix up self validation goals for themselves.

Roy F. Baumeister reported that appraisal effects of self esteem are complicated by several factors. Because, people possessing high self esteem exaggerate their success and good traits based on objective measures of outcomes. High esteemed people frankly accept their good qualities along with narcissistic, defensive and conceited individuals. The study in students showed modest correlations between self esteem and school performance do not indicate that high self esteem leads to good performance. But definitely high self esteem is partly the result of good school performance. The measures taken to improve the self esteem of

pupils have not shown improvement in academic performance. Job performance in adults is related to self esteem even though correlations may vary widely across studies. Self esteem was found to be affected by occupational success but not the other way. It was also reported that self esteem studies have failed to find that self esteem causes good task performance and helpful in all job contexts. People with high self esteem are more likeable and attractive to have better relationships and to make better impressions on others, than people low in self esteem. Individuals with high self esteem are more willing to speak up in groups and also may criticise the group's approach. Also it was found that leadership does not stem directly from self esteem. Finally Baumeister et al., (2003) recommended the use and boost of self esteem as a reward for social desirable behaviour and self improvement (Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, 2003).

The investigation was carried on organisation based self esteem (OBSE) by Lee, (2003) on two banks in Korea. The antecedents of OBSE were brought out in the study. It was found that job complexity, participatory management, job security concern, co-worker support and organisational tenure surfaced as the antecedents of OBSE. The intrinsic job characteristics such as job complexity and participatory management appear to be more influential antecedents than job security concern and co-worker and individual characteristics which are extrinsic job characteristics.

The study was conducted in a tertiary learning institute among two hundred fifty five mathematics students in United Arab Emirates. In this

investigation the author explores the relationship among global self esteem, academic self efficacy and academic performance (Afari, Ward, & Khine, 2012). The students' average grade of mid semester and final semester was used for performance measures in the study. A confirmatory factor analysis using analytic moment structures (AMOS) was used to establish and validate the structural model in this study (Afari et al., 2012).

Crocker, J., & Park, (2004) investigated the benefits associated with having high self-esteem. The authors propose that the importance of self-esteem lies more in how people strive for it rather than whether it is high or low. They argue that in domains in which their self-worth is invested, people adopt the goal to validate their abilities and qualities, and hence their self-worth. When people have self-validation goals, they react to threats in these domains in ways that undermine learning; relatedness; autonomy and self-regulation; and over time, mental and physical health. The short-term emotional benefits of pursuing self-esteem are often outweighed by long-term costs. Previous research on self-esteem is reinterpreted in terms of self-esteem striving. Cultural roots of the pursuit of self-esteem are considered.

This study explored that student teacher self esteem was not static. Based on the energy level of the individual, self esteem fluctuated in connection with the professional role demands in student teachers. Self esteem created an impact on their ability to cope up, ability to interact effectively with adults and children (Dobbins, 1996).

This study used before and after experimental design to study the effect of life skills training on relation to mental health and self-esteem of university students. The results showed that life skill training decreased the effects of depression, anxiety and stress in students. It also enhanced the self-esteem in students (Sobhi-Gharamaleki & Rajabi, 2010).

This study investigated the relation between academic self esteem levels of students and stress levels in them. These two varied according to level of education of their parents, economic condition of their families and the number of the years in which they received education. Other findings showed the existence of a reverse and meaningful relation between academic self esteems and stress levels of the students (Erturgut & Erturgut, 2010).

This study explored the interaction between self esteem and gender this had a small but significant effect on weight preoccupation. The outcome suggested that the Counsellors should be aware of this when designing programs to treat weight preoccupation in conjunction with low self esteem, especially for women (Pritchard, 2010).

This study examined the relationship among self-esteem, general self-efficacy, locus of control, low neuroticism, intrinsic job characteristics and job satisfaction. The job characteristics and job complexity mediated the relationship between core self-evaluations and job satisfaction. By conducting two studies this model was tested (Judge et al., 2002).

2.9 Studies in Engineering Education

This paper discussed the increase in the number of private engineering colleges in the state of Kerala. Enrolment in engineering education has increased from two thousand eight hundred in 1991 to about twenty eight thousand in 2008. Since 2004 the out- turn rate of students in engineering education across branches had been declining steadily, this has been brought out after a careful analysis. This steady decline has been studied across different branches out of five colleges in southern Kerala. This paper discussed the probable causes for this decline of out-turn rates in connection with the state affair (Sunil Mani and M Arun, 2012).

This paper aimed to study the adoption of total quality management practices in engineering institutions in India from the managements' perspective. This study established a conceptual model with twenty seven critical dimensions of quality management leading to institutional performance using five dimensions. Out of five performance dimensions faculty competence and excellence is one among them (Sayeda, Rajendran, & Lokachari, 2010).

2.10 Conclusions from Review of Literature

The main purpose of literature review is to explore the relationship between self-esteem, general self efficacy and competence of teachers who teach engineering subjects in colleges in Kerala. In this the pertinent literature in connection with the variables are studied.

Self-esteem and general self efficacy has a strong connection with competence in literature. In human functioning competence is the

threshold of job performance. There exists a strong evidence and support from literature that the variables self-esteem and general self efficacy are strongly associated with the competence of individuals which is converted to performance. There exist a strong influence of self esteem and self efficacy in exhibiting and displaying competence at work. The extensive literature review further substantiates that there exists gap in literature in displaying studies in connection with self esteem, self efficacy and competence. Most of the studies are concerned with self esteem, self efficacy and performance but studies lack in competence. Hence this is strong evidence that shows that this study will add body to the literature and hence fill the gap No study done with competence as the dependent variable. Competence is the threshold of job performance and job effectiveness. In the teacher context, very few studies have been found with reference to teacher competence in higher education. No study exists in India addressing the competence of engineering teachers. Many studies in literature have proved positive correlation with self-esteem and academic achievement.

Hence, the review of literature provides the main research questions for this study:

1) What is the relationship between competence and Self-esteem of teachers in engineering colleges in Kerala?
2) What is the relationship between competence and general self-efficacy of teachers in engineering colleges in Kerala?
3) What is the relationship among competence self-esteem and general self-efficacy of teachers in engineering colleges in Kerala?

4) To determine whether general self-efficacy and/or self-esteem influence competence of teachers in engineering colleges in Kerala?

5) To find whether general self-efficacy can be used as a predictor of competence of teachers in engineering colleges in Kerala?

From the detailed review of literature the proposed conceptual model of the study is given below:

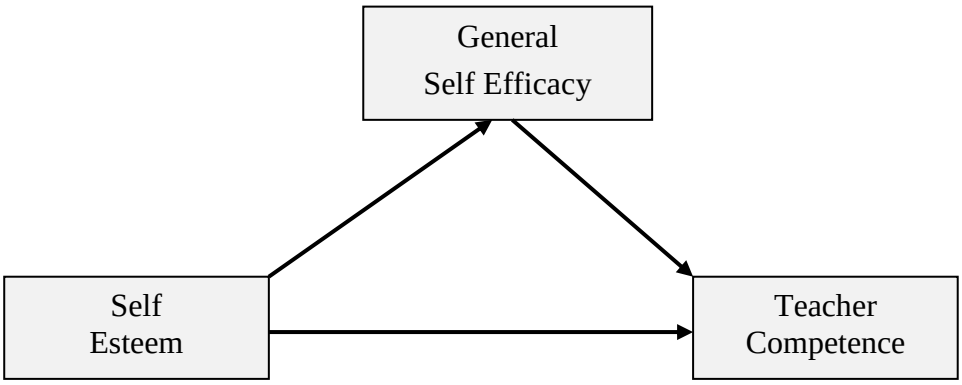


Figure 2.5: The conceptual model

After reviewing the literature it is understood that clear research gap exists in the area of competence in relation to self esteem and general self efficacy. Therefore it is important to establish a link between competence, self-esteem and general self-efficacy. Furthermore, it becomes valuable to study on competence in relation to self esteem and general self efficacy among engineering college teachers.

Chapter 3

RESEARCH METHODOLOGY

Contents

3.1 Methodology of the study

Chapter three explains the methodology of this study. This includes scope and significance, statement of the problem, conceptual model, objectives, variables, and operating definitions of this study. The objectives of the study were finalized after reviewing the literature on competence, self-esteem and general self-efficacy. Accordingly hypotheses were

formed. Further it provides a detailed explanation of the design of the research study, pilot study, population of the study, sample size, data collection, respondents of the study, tools of data collection, pretesting of scales used in the study, data processing and choice of suitable statistical analyses.

3.2 Significance of the study

This study is highly significant from both the theoretical and practical perspectives. It may add value to the field of education management. This study may help in the recruitment of teachers, their training and in the successive planning of their career. Self-esteem and general self-efficacy are the qualities that can be enhanced for the development of effective teaching. Hence, in this context, to study the influence of self-esteem and general self efficacy on competence is of great importance in the educational research field. Appropriate training programmes may be implemented for enhancing the self esteem and general self- efficacy which in turn may enhance competence of engineering college teachers. These interventions may probably decrease the turn over intensions. The training interventions may increase their competence and hence may improve the quality of teachers promising quality engineering education to students. The study is very appropriate in connection with the results that may be proved which are empirically valid with respect to the relationship between teacher competence, self esteem and general self efficacy.

The results of the present study based on competence, self esteem and general self efficacy may invariably help in developing a new competence model in the field of education management.

3.3 Statement of the research problem

The review of literature provided insights in to the possibility of influence of self-esteem and general self-efficacy on competence. Therefore the research problem is to examine the connectivity among self-esteem, general self-efficacy and competence of teachers of engineering colleges in Kerala.

3.4 The conceptual model of the study

A model is proposed based on a detailed review of literature on competence, self-esteem and general self-efficacy which is given below:

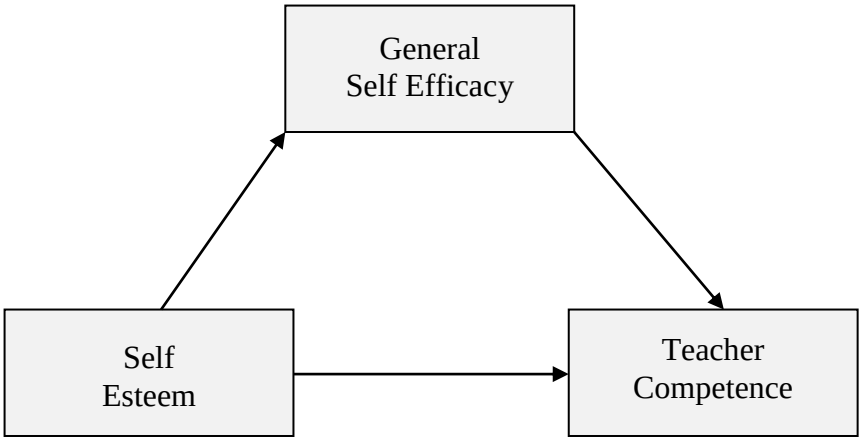


Figure 3.1: The conceptual model

3.5 Objectives of the study

1) To examine the relationship between self-esteem and general self-efficacy.

2) To understand the relationship between general self-efficacy and competence.

3) To test the mediating role of general self-efficacy on the relationship between self-esteem and competence.

4) To develop and test a model linking self-esteem, general self-efficacy and competence among the teachers in the engineering colleges in Kerala.

3.6 Hypotheses of the study

Based on the objectives, alternate hypotheses were formulated to find out the relationship among self-esteem, general self-efficacy and competence.

H1: There is a positive relationship between self esteem and general self efficacy.

H2: There is a positive relationship between general self efficacy and competence.

H3: Self-esteem has direct and significant effect on teacher competence.

H4: Self-esteem has direct and significant effect on general self-efficacy.

H5: General self-efficacy has a positive and significant effect on competence.

3.7 Scope of the study

The scope of the study is explained by the components: population, place of study, data sources and the period of the study.

3.7.1 Place of study

The place of study is Kerala. All the three regions namely northern, central and southern regions of Kerala are considered for the study. There are approximately about 140 engineering colleges in Kerala which are under the government and non-government category.

3.7.2 Data sources

The primary data is collected using a questionnaire by survey method. The respondents were the permanent teachers of engineering colleges in Kerala who teach the branches namely mechanical engineering, electronics & telecommunication engineering, electrical engineering, civil engineering and computer science engineering.

3.7.3 Period of data collection for the Study

The data collection was conducted during the year 2015-2016 during the working days of the semester period.

3.8 Research design

There are different kinds of research design which are explained below.

3.8.1 Exploratory Design is "the research that focuses on collecting either secondary or primary data and using an unstructured format, or informal procedures to interpret them" (Malhotra, 2008).

3.8.2 Descriptive design is the "research that uses a set of scientific methods to collect raw data and create data structures that describe the existing characteristics of a defined target population or market structure " (Malhotra, 2008).

3.8.3 Causal design is the "research designed to collect raw data and create data structures and information that will allow the researcher to model cause- and- effect relationships between two or more market (or decision) variables " (Malhotra, 2008).

3.8.4 Explanatory research is defined as " an attempt to connect ideas to understand cause and effect, meaning researchers want to explain what is going on" (Malhotra, 2008).

The research design in this study is **descriptive and explanatory** in nature.

3.9 Population

The population of the study is constituted by the permanent teachers of engineering colleges of Kerala who teach the five branches of engineering such as mechanical, electronics & telecommunication, electrical, civil and computer science engineering .All the teachers who have more than one year of experience are considered for the study.

3.10 Sample design

The sample for the study is drawn from those colleges who gave permission to collect data. Two- stage non-probability convenience sampling technique is adopted. In the first stage, colleges were sought

permission for collecting data. Then a region wise list is prepared based on the consent given by the college authorities**.** Then in the second stage the units of observation are identified through non-probabilistic convenience sampling from the three regions of Kerala.

3.10.1 Sample size

Sample size is decided by using covariance based structural equation modelling technique following the recommendation of hair et al (2010). Sample size is fixed to be ten times of the number of items in the questionnaire. The total number of items in the questionnaire is seventy. Sample size is fixed as seven hundred. One thousand and nine questionnaires are distributed online and offline to meet the target sample out of which seven hundred and twenty nine questionnaires are received. Thirteen incomplete questionnaires are removed. Seven hundred and sixteen questionnaires constitute the usable data for the study. Approximately eight percent of the population is collected as sample for the study.

3.10.2 Composition of the sample size

Composition of the sample size is described below. Two hundred and twelve responses are collected from the southern region, four hundred and one from the central region and one hundred and three from the northern region of Kerala.

List of colleges categorized into regions

Table 3.1: The region wise and college wise break –up of data collected from engineering colleges of Kerala.

Southern Kerala	Central Kerala	Northern Kerala
1. Engineering college Cherthala (20)	1. Sree Narayana Guru College of engineering (51)	1. AWH Engineering college (10)
2. Sreechitra Tirunal college (10)	2. MES College of Engineering (40)	2. KMCT College of Engineering (9)
3. Kvvs institute of technology (10)	3. Adi Sankara Institute of Science and Technology (41)	3. College of Engineering (10)
4. Archana college of engineering (10)	4. Cochin University of Science and Technology (32)	4. LBS college of Engineering (11)
5. Mangalam college of engineering (10)	5. Model Engineering College (58)	5. Cochin college of engineering and technology (7)
6. college of Engineering trivandrum (40)	6. Mar Athnasius college of Engineering (79)	6. College of engineering. Kannur (16)
7. Amirtha institute of technology (15)	7. Fedral instiute of Science and Technology (37)	7. Vimal jyothi engineering college (11)
8. Yonus college of engineering & Technology (10)	8. Sngist (32)	8. Chinmaya institute of technology (10)
9. Thangal Musaliar college of Engineering (75)	9. Shradaya college of engineering (16)	9. MES college of engineering (19)
10. Mar Baselious Institute of Technology (12)	10. Jyothi engineering college (15)	(103)
(212)	(401)	

3.10.3 Types of colleges included in the study

The types of colleges included in the study are government engineering colleges, private engineering colleges and aided engineering colleges of Kerala.

3.10.4 Sampling frame

The respondents or the unit of study is drawn from the list of engineering colleges after getting permission for data collection. All the permanent teachers are considered for data collection from the colleges of Kerala. Ten colleges are considered from the southern and central regions of Kerala and nine colleges are considered from the northern region for the study. The questionnaire is administered by the researcher through survey method.

3.10.5 Selection of the sampling unit

All the permanent teachers from the list of colleges cited are considered for data collection. Those respondents willingly consented to participate are only considered as the sampling unit.

3.11 Variables of the study

The three important variables of the study are as follows:

1) Self-esteem (Independent variable)
2) General self-efficacy (Mediating variable)
3) Competence (Dependent variable)

3.12 Definition of major concepts

The conceptual definition along with the operational definition of teacher, engineering colleges, competence, self-esteem and general self-efficacy are given below.

3.12.1 Operational definition of teacher

Teacher is defined as a person whose job involves teaching and performing the administrative activities in connection with teaching and career counseling activities of student's in engineering colleges.

3.12.2 Operational definition of engineering colleges

Engineering colleges mean colleges which offer education in the branches of mechanical, electronic & communication, electrical, civil and computer science engineering. They are affiliated to any university in Kerala and are recognized by the All India Council of Technical Education.

3.12.3 Competence

Competence is defined by Epstein, Ronald M and Hundert, (2002) as the "habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served."

3.12.4 Operational definition of competence

Competence is defined as the abilities of the teacher in terms of subject knowledge, technical skills, evaluation of performance of students, updating academic programmes, designing curriculum, providing project guidance, administering laboratory tests and giving counseling for students.

3.12.5 General self-efficacy

General self-efficacy is defined as "one's belief in one's overall competence to effect requisite performances across a wide variety of achievement situations" (Eden, 1988).

3.12.6 Operational definition of general self-efficacy

General self-efficacy is defined as the belief in one's capability in oneself about teaching competence, the ability to achieve goals and to overcome obstacles in daily living. They evaluate their skills, capabilities and competence from past events that makes them face and succeed the existing challenges in the professional environment.

3.12.7 Self-esteem

In his book, 'The power of self-esteem' Branden, (1992) remarks that "self-esteem is the experience that we appropriate to life and to the requirements of life. More specifically, self-esteem is

1) Confidence in our ability to think and to cope with the basic challenges of life.
2) Confidence in our right to be happy, the feeling of being worthy, deserving, entitled to assert our needs and wants and to enjoy the fruits of our efforts".

3.12.8 Operational definition of self-esteem

Self-esteem is defined as the overall feeling of self-worth of the teachers. They evaluate their strengths, competence and confidence that drive and help them to face and cope up with the challenging and demanding teacher situations in every day professional context.

3.13 Tools of data collection

The data are collected by using standardized scales evolved by well known authors widely used in the research field of Psychology and Education. Data are collected on the variables of study and on socio-demographic details of the teacher respondents from engineering colleges of Kerala. The questionnaire has seventy two items for the constructs-competence, self-esteem and general self-efficacy. Added to these demographic variables, sex, educational qualification, experience and designation are also included in the study. Hence the tool of data collection is framed using the scales and they are explained below.

3.13.1 Self-esteem scale

Global self-esteem is measured by the Rosenberg's Self-esteem Scale (Rosenberg, 1965). The participants have completed the questionnaire by ticking the most appropriate choice with each of the ten items on a five-point scale (five for strongly agree, four for agree, three for neutral, two for disagree and one for strongly disagree). The scores for negatively worded items are reversed. The total self-esteem score is obtained by summing up all the scores of all the items. The total score can range from ten to fifty. Higher scores reflect higher self-esteem and lower scores reflect lower self-esteem.

3.13.2 General self- efficacy scale

The questionnaire also contains "general self-efficacy scale" by Schwarzer, (1995) . It consists of ten items which measure the general sense of perceived self-efficacy. Participants are asked to answer each item on five-point scale; one means never true, two means infrequently

true, three means sometimes true, four means frequently true; and five means always true.

Respondents are requested to be spontaneous and as accurate as possible in giving the responses. Respondents are assured of confidentiality about their responses.

The general self-efficacy scale is shown to be valid, reliable (Grau, R., Salanova, M., & Peiró, 2000) and robust in more than thirteen countries (Schwarzer 1997). It has also shown good convergent and discriminatory validity (Schwarzer and Jerusalem 1995). Several studies have confirmed the high reliability, stability, and construct validity of the general self-efficacy scale. The Cronbach's alpha value of the general self-efficacy scale is found to be 0.8 and above in the other studies.

3.13.3 Teacher competence scale

The teacher competence scale is used to assess the teacher's competences who teach engineering subjects in the colleges of Kerala. The scale developed by Ninsiima, (2003) was adapted and used in this study. In this tool, fifty two competences are measured in seven sub dimensions under the construct teacher competence. They are:

1) Subject knowledge (9)
2) Evaluation of performance of students (6)
3) Update academic programmes (6)
4) Design curriculum (7)
5) Project guidance (6)
6) Administer laboratory test (7)
7) Academic and career Counseling activities (11)

Responses to each item are structured by using five-point Likert scale where one means never true, two means infrequently true; three means sometimes true, four means frequently true and five means always true.

3.14 Pilot study

A pilot study is used to check the availability of data in the engineering colleges of Kerala. A list of colleges who have accepted and cooperated to administer the questionnaire is made from the population. The list is derived from northern, central and southern regions of Kerala. The colleges are approached through phone calls and electronic mails to get the consent for data collection. Pilot study has helped the researcher to understand the components of the population and the sample. The researcher understood that all colleges would not allow conducting data collection and hence it is required to obtain permission from the respective colleges through proper channel. Hence it was easy to check the feasibility and the time required to cover the three regions of Kerala.

The questionnaire is administered to the professors who head the departments, to check the importance and relevance of competence components to use in the study. It is found that all items in the scale are applicable and relevant to the context of the study.

As mentioned earlier, the tools used in this study are pretested to identify if there are any flaws and bombastic language in the instruments. The questionnaire is finalized after incorporating the demographic variables of the teachers such as age, designation, educational qualification, sex,

experience and number of research publications. A sample of hundred teachers from engineering colleges is collected to pre-test the questionnaire. The teachers have belonged to mechanical, electronics & communication, electrical, civil and computer science branches of engineering.

While pre-testing the tools of the study, researcher has identified that the respondents have not understood and are not comfortable with certain terms. Therefore, such words are replaced with appropriate and familiar words. The modified and revised questionnaire is employed for the data collection for the entire research study.

3.14.1 Reliability

The reliability scores of the constructs are checked with the help of SPSS.

The Cronbach alpha values for the variables are shown in the table below:

Table 3.2: Cronbach alpha of the variables

Factors	No. of statements	Cronbach Alpha
Self Esteem	10	0.700
Subject Knowledge	9	0.848
Student Evaluation	6	0.829
Update Academic Programs	6	0.892
Design Curriculum	7	0.812
Project Guidance	6	0.856
Administer laboratory test	7	0.860
Career Counseling	11	0.874
General Self Efficacy	10	0.855

While applying Likert scales, it is necessary to compute Cronbach's alpha coefficient for reliability and consistency (Gliem, J. A., & Gliem, 2003). The Cronbach's value for Self-esteem is 0.700. The Cronbach's value for the dimensions of competence construct is as follows. It is 0.848 for subject knowledge of teachers; for evaluation of performance of students is 0.829; for update of academic programme is 0.89; for designing curriculum is 0.812; for project guidance is 0.856; for administering laboratory test is 0.860 and for career counseling is 0.874. For general self-efficacy, Cronbach's value is 0.855. All the values are well above 0.7 which is the prescribed value. Therefore reliability is proved of the constructs.

3.15 Tools of data analysis

The data is edited, coded and analyzed using Statistical Packages for Social Sciences (SPSS 23) and Analysis of Moment Structures (AMOS 23). The incomplete inventories are discarded from the data set. Finally, seven hundred sixteen responses are included for analysis. The characteristic profiles of the respondents are shown by using descriptive statistics. Structural equation modeling by using AMOS is used to propose and validate the model of this study. Mediation analysis is performed by using structural equation model in AMOS. Since the t test did not show significant difference for gender, experience and educational qualification, the researcher has decided to conduct the hypotheses testing by using structural equation model in AMOS. This also has established the conceptual model in the study.

3.16 Limitations

This study has some limitations each of which provides a way for the future studies. First of all the sample consisted of teachers of engineering college teachers belonging to the five branches of engineering namely, mechanical, electronics and communication, electrical, civil and computer science. Hence this study cannot be generalized to other domains. Hence, other domains such as other branches of engineering, medicine, humanities and arts and science domains should also be included in the sample of the future research in order to understand the relationships among self-esteem, general self-efficacy and competence. Hence, cannot be generalized to teachers.

Second the data was collected from the state of Kerala. Even though it represents the engineering teachers of Kerala, future studies could include sample from other states also.

Third, the present data was based on self-report measures, suggesting that would produce respondent bias and hence affect the quality of data.

Finally, other variables such as personality variables, teacher engagement, job satisfaction, stress and mental well- being could be included in future studies. Hence influence of contextual variables that can be moderators can also be included in the future study.

Chapter 4

DESCRIPTIVE ANALYSIS

Contents

This chapter provides descriptive statistics of respondents, results, reliability and validity measurements of the model, test of normality, and Friedman rank test.

4.1 Profile of respondents

Profiles of respondents based on sex, marital status, age, category of institution, designation, branch of engineering, educational qualification, experience, industry experience, teaching experience, projects undertaken, books written, number of research papers published in national and international journals and self-rating of teachers.

4.1.1 Classification based on sex

Table 4.1: Frequency distribution of sex composition of teachers

Sex	Frequency	Percent
Male	278	38.8
Female	438	61.2
Total	716	100.0

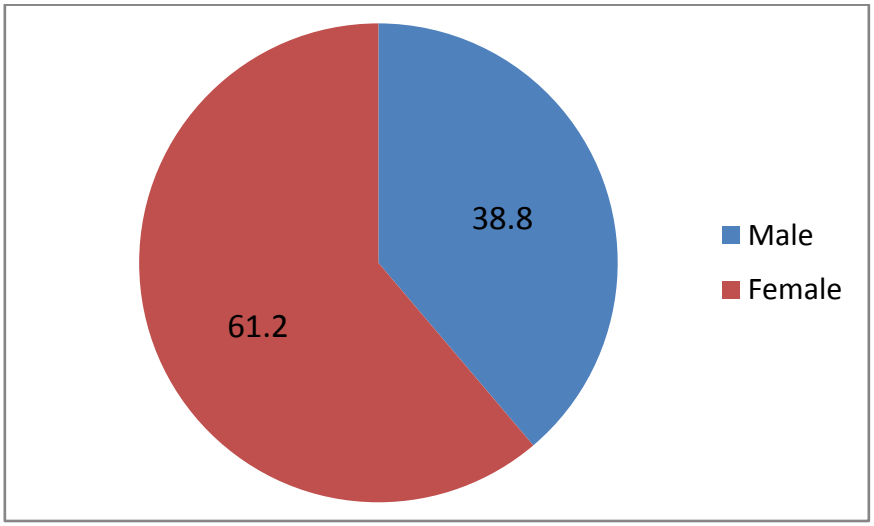


Figure 4.1: Sex compositions of teachers

The data depicts higher percentage representation of female teachers. There are two hundred seventy eight (38.8%) male teachers and four hundred thirty eight (61.2%) female teachers in the sample.

4.1.2 Classification based on marital status

Table 4.2: Frequency Distribution of Marital Status of Teachers

Marital Status	Frequency	Percent
Married	560	78.2
Unmarried	156	21.8
Total	716	100.0

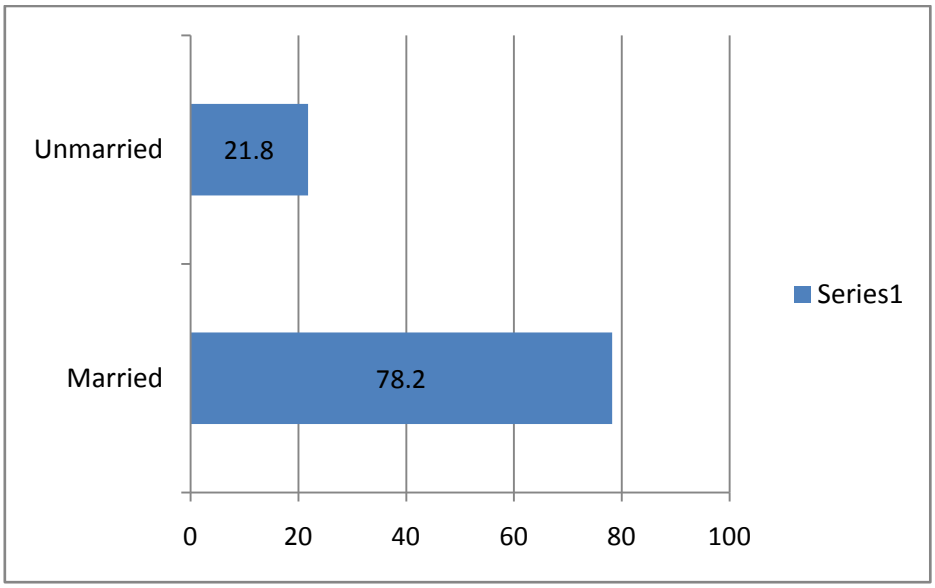


Figure 4.2: Marital status of respondent

Out of the seven hundred sixteen teachers only five hundred sixty (78.2%) are married and one hundred fifty six are unmarried (21.8%).

4.1.3 Classification based on age

Table 4.3: Frequency Distribution of age of Teachers

Age Group in Years	Frequency	Percent
Below 30	314	43.9
30-40	217	30.3
40-50	112	15.6
Above 50	73	10.2
Total	716	100.0

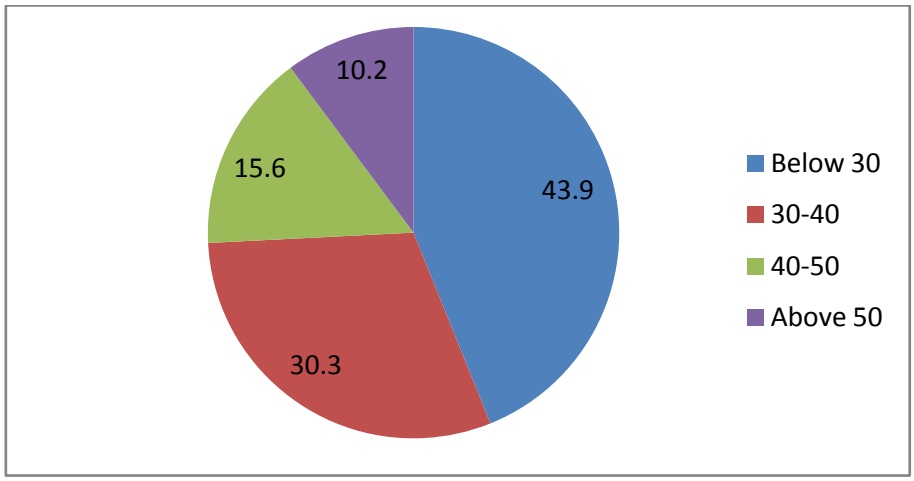


Figure 4.3: Age of teachers

The age of 716 teacher respondent vary from twenty five years to fifty eight years. The respondents below the age of thirty are three hundred fourteen (43.9%), between the age of thirty to forty years are two hundred seventeen (30.3%), from forty years to fifty years of age are one hundred twelve in number (15.6%) and above the age of fifty are seventy three (10.2%) are extracted from the sample size of seven

hundred sixteen. This covers the sample from minimum to maximum years of age and contributes to an unbiased sample which represents the population of the study.

4.1.4 Classification based on category of institution of teachers

Table 4.4: Frequency Distribution of Category of Institution of Teachers

Category of Institution	Frequency	Percent
Government	330	46.1
Self Financing	386	53.9
Total	716	100.0

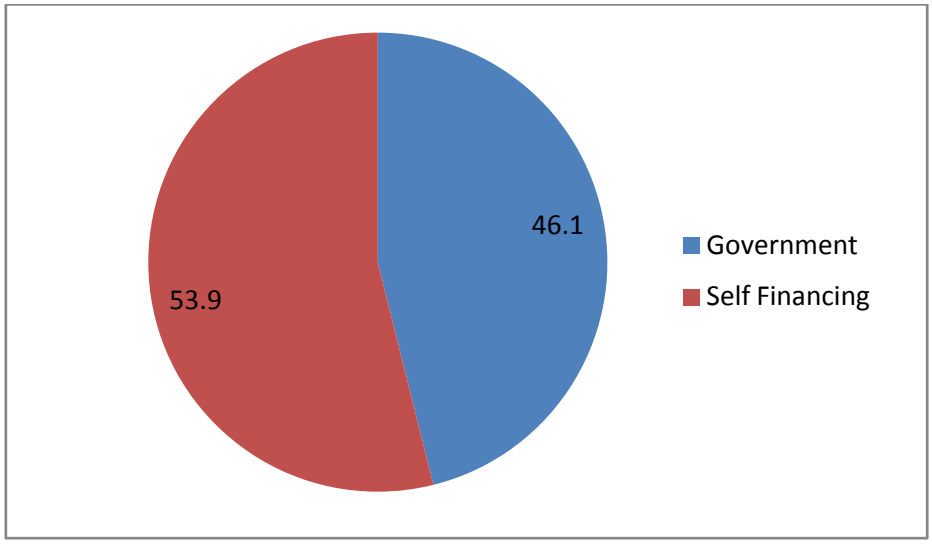


Figure 4.4: Category of institution

Out of seven hundred sixteen teachers three hundred thirty teachers belong to the government institution (46.1%) and three hundred eighty six teachers belong to the self financing institutions (53.9%) in Kerala.

4.1.5 Classification based on designation of teachers

Table 4.5: Frequency Distribution of Designation of Teachers

Designation	Frequency	Percent
Assistant Professor	563	78.63
Associate Professor	89	12.4
Professor	64	8.9
Total	716	100.0

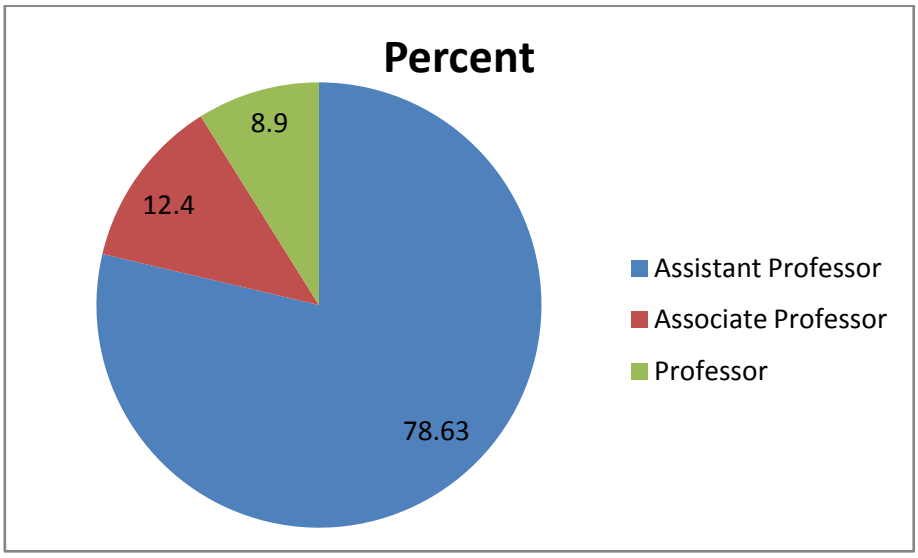


Figure 4.5: Designation of teachers

Out of seven hundred sixteen teachers five hundred sixty three are Assistant professors (78.63%), eighty nine are Associate professors (12.4%) and sixty four are professors (8.9%).

4.1.6 Classification based on branch of engineering

Table 4.6: Frequency Distribution of Branch of Engineering of Teachers

Branch of Engineering	Frequency	Percent
Mechanical	134	18.7
ECE	167	23.3
EEE	140	19.6
Civil	125	17.5
CSE	150	20.9
Total	716	100.0

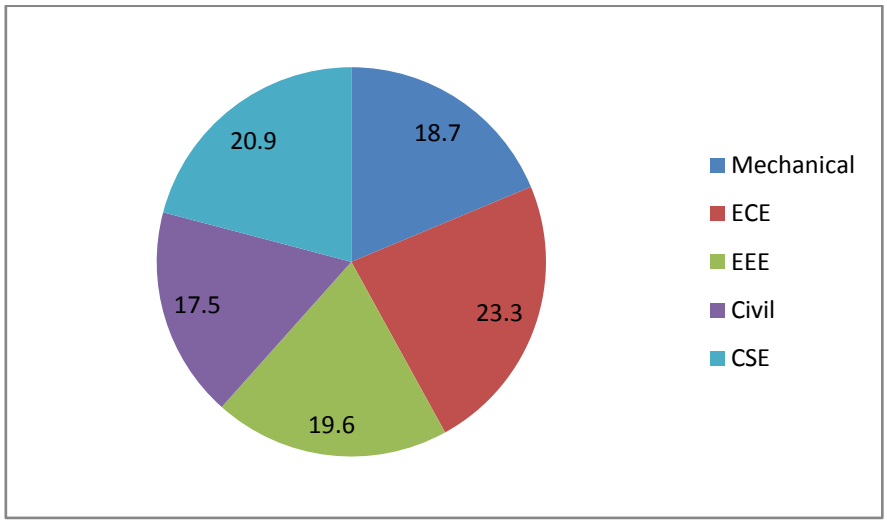


Figure 4.6: Branch of engineering

Data collected from five main branches of engineering are Mechanical, Electronics &communication, Electrical, civil and computer science engineering. It was found that there are one hundred thirty four teachers from Mechanical engineering (18.7%), one hundred sixty seven from Electronic communication engineering (23.3%), one hundred forty

from Electrical engineering (19.6%), one hundred twenty five from civil engineering (17.5%), one hundred fifty from computer science engineering (20.9%).

4.1.7 Classification based on educational qualification

Table 4.7: Frequency Distribution of Educational Qualification of Teachers

Educational Qualification	Frequency	Percent
UG	28	3.9
PG	611	85.3
Ph.D	77	10.8
Total	716	100

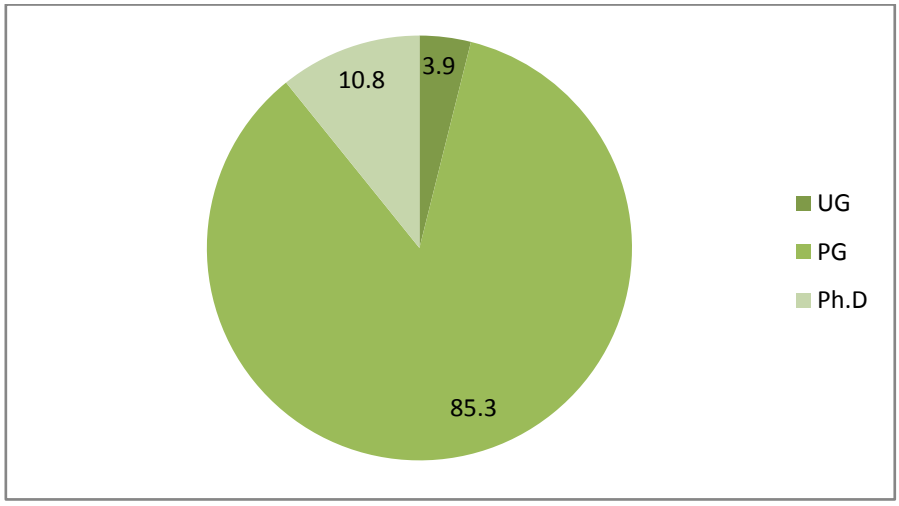


Figure 4.7: Educational qualification

More than half of the respondents were post graduate engineers with a count of six hundred eleven (85.3%), twenty eight are undergraduates which account for (3.9%) and seventy seven doctorates (10.8%) in the sample of seven hundred sixteen.

4.1.8 Classification based on experience

Table 4.8: Frequency Distribution of Total Experience of Teachers

Total Experience in years	Frequency	Percent
Below 5	283	39.5
5-15	278	38.8
Above 15	155	21.6
Total	716	100.0

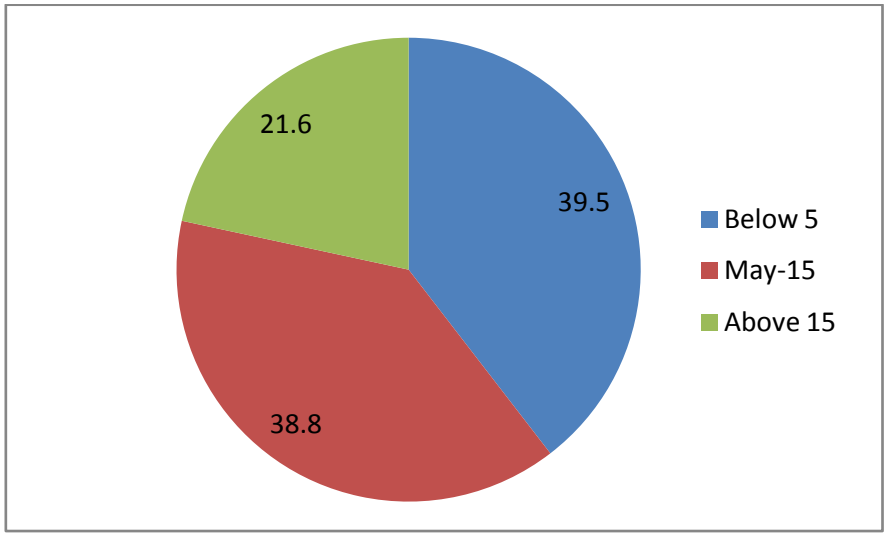


Figure 4.8: Total experience

Out of seven hundred sixteen teachers two hundred eighty three teachers have less than five years of experience, two hundred seventy eight teachers have more than five years but less than fifteen years of experience and one hundred fifty five teachers have more than fifteen years of experience.

4.1.9 Classification based on industry experience

Table 4.9: Frequency Distribution of Industry Experience in years of Teachers

Industry Experience in years	Frequency	Percent
Nil	484	67.6
Upto 3	169	23.6
4 and above	63	8.8
Total	716	100.0

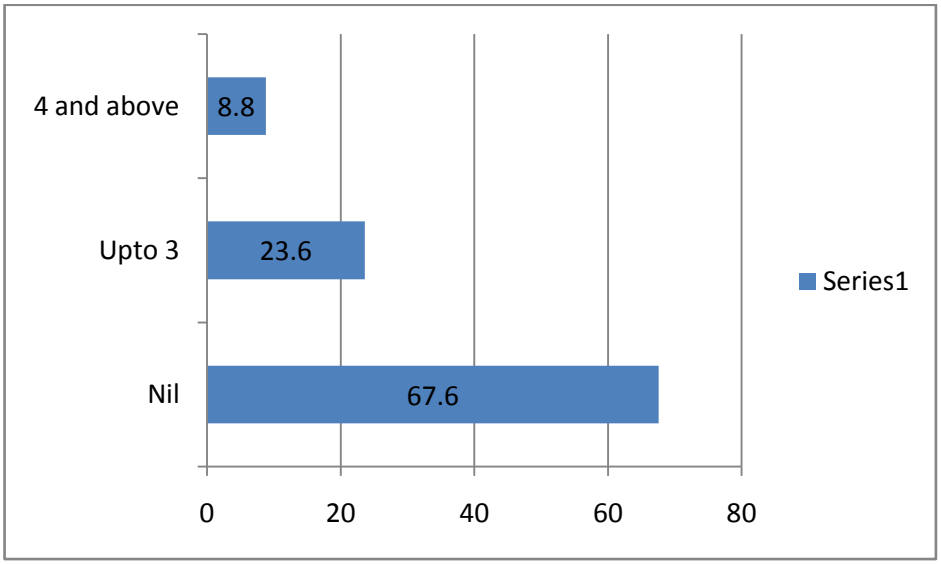


Figure 4.9: Distribution of Industry Experience in years of Teachers

Out of seven hundred sixteen teachers four hundred eighty four have no industry experience, one hundred sixty nine have less than three years of industry experience and sixty three teachers have more than four years of industry experience.

4.1.10 Classification based on teaching experience

Table 4.10: Frequency Distribution of Teaching Experience of Teachers

Teaching Experience in years	Frequency	Percent
Below 5	323	45.1
5-15	271	37.8
Above 15	122	17.0
Total	716	100.0

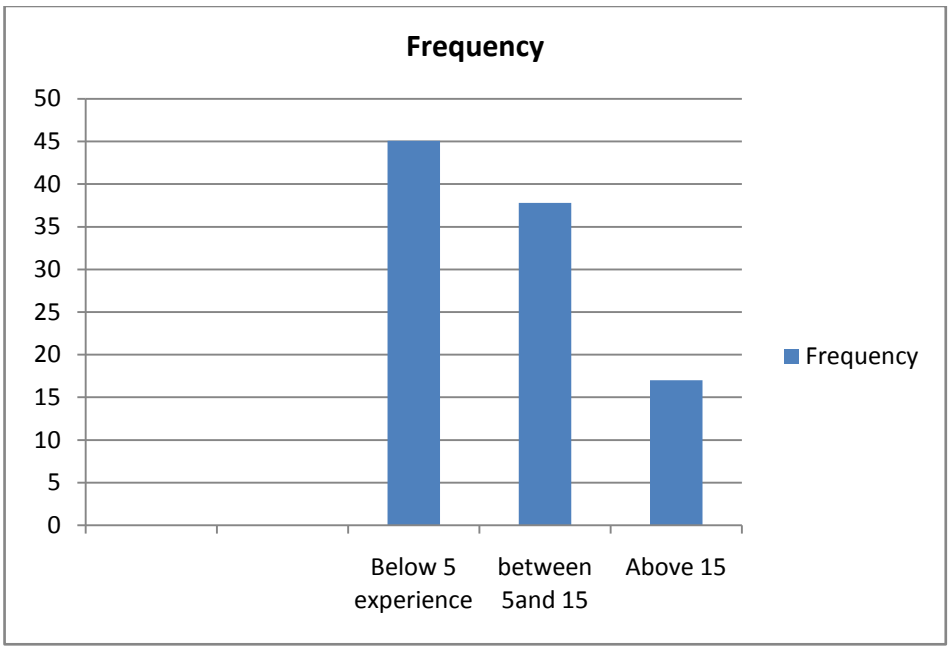


Figure 4.10: Teaching Experience of Teachers

Out of seven hundred sixteen teachers three hundred twenty three (45.1%) have below five years, two hundred seventy one (37.8%) have between five and fifteen years, one hundred twenty two (17%) have above fifteen years of teaching experience.

4.1.11 Classification based on projects

Table 4.11: Frequency Distribution of Number of Projects of Teachers

Number of Projects	Frequency	Percent
Nil	386	53.9
1-2	201	28.1
3-4	73	10.2
Above 4	56	7.8
Total	716	100.0

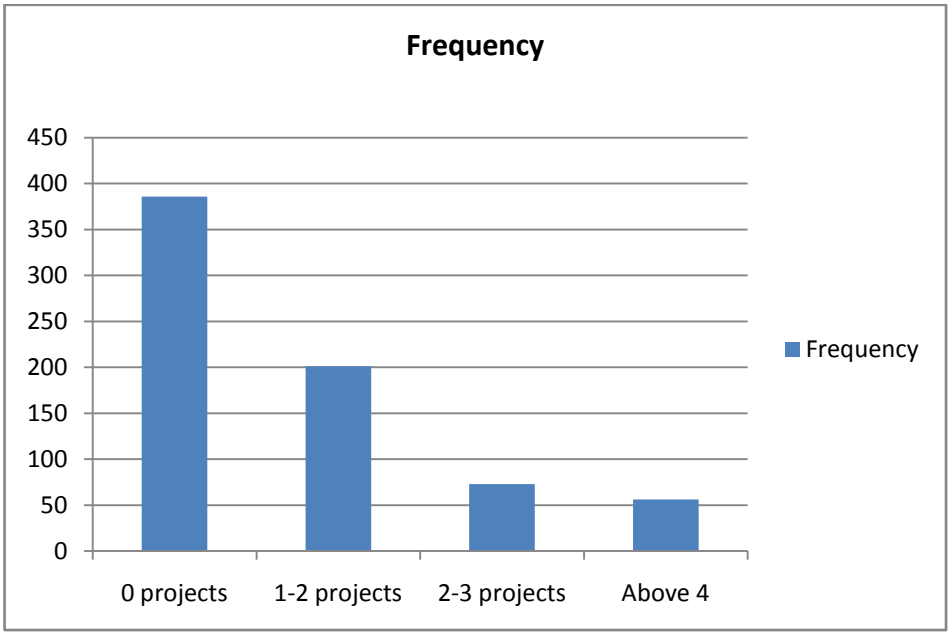


Figure 4.11: Distribution of Number of Projects of Teachers

Out of seven hundred teachers, three hundred eighty six (53.9%) have not undertaken any project. Two hundred one (28.1%) teachers have done two projects, seventy three (10.2%) have done four projects and fifty six (7.8%) have done above four projects.

4.1.12 Classification based on books written

Table 4.12: Frequency Distribution of Books Written by Teachers

Books Written	Frequency	Percent
Yes	42	5.9
No	674	94.1
Total	716	100.0

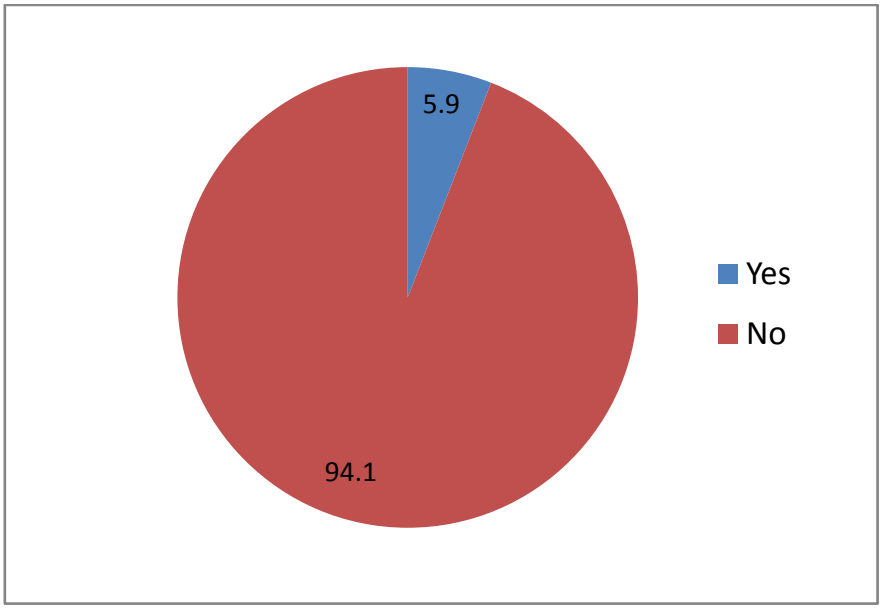


Figure 4.12: Frequency Distribution of Books Written by Teachers

Forty two teachers have written books in their subjects (5.9%) and six hundred seventy four teachers have not written any book (94.1%).

4.1.13 Classification based on research articles

Table 4.13: Frequency Distribution of Number of Research Articles published by Teachers

Number of Research Articles	Frequency	Percent
Nil	290	40.5
Below 4	241	33.7
4 to 8	108	15.1
Above 8	77	10.8
Total	716	100.0

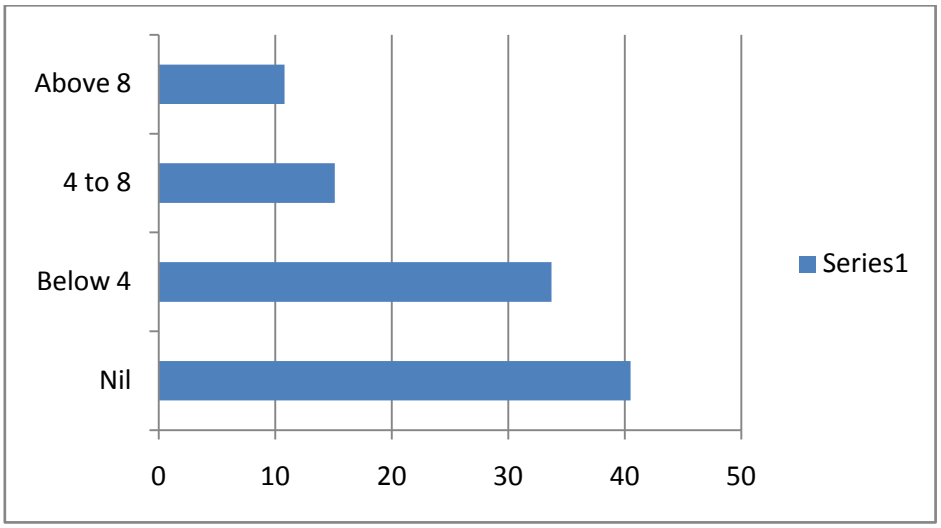


Figure 4.13: Research Articles published by Teachers

The sample consists of two hundred ninety teachers who have never contributed for research articles (40.5%), two hundred forty one teachers have published less than four research papers (33.7%), one hundred eight teachers have published more than four but less than eight research papers (15.1%) and seventy seven teachers have published more than eight research papers (10.8%).

4.1.14 Classification based on international research articles

Table 4.14: Frequency Distribution of Number of International Articles published by teachers

Number of International Articles	Frequency	Percent
Nil	380	53.1
Below 3	220	30.7
3 to 6	54	7.5
Above 6	62	8.7
Total	716	100.0

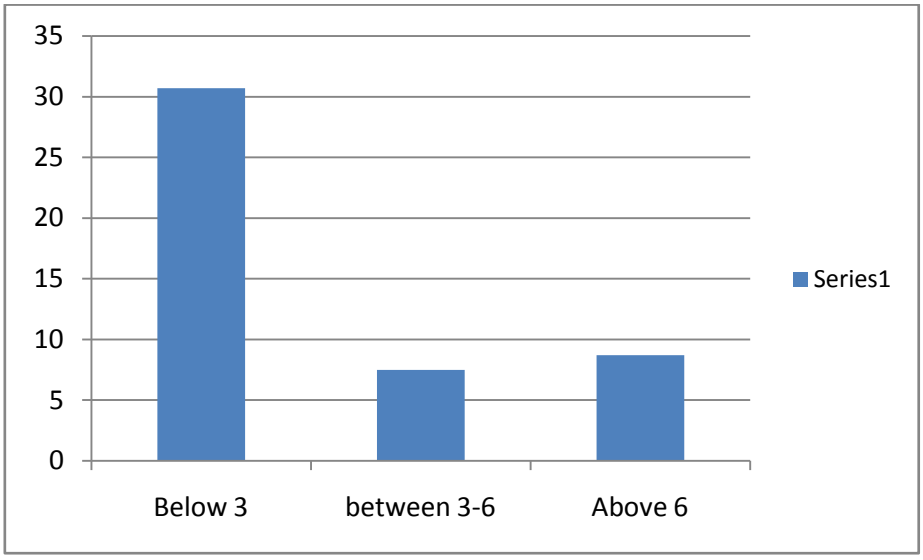


Figure 4.14: International research Articles

Three hundred eighty (53.1%) of teachers have no international publication. Two hundred twenty (30.7%) have less than three publication, fifty four (7.5%) teachers have below six publications and sixty two (8.7%) teachers have above six publications.

4.1.15 Classification based on National publications

Table 4.15: Frequency Distribution of Number of National level publications by Teachers

Number of National Articles	Frequency	Percent
Nil	402	56.1
Below 3	242	33.8
3-6	38	5.3
Above 6	34	4.7
Total	716	100.0

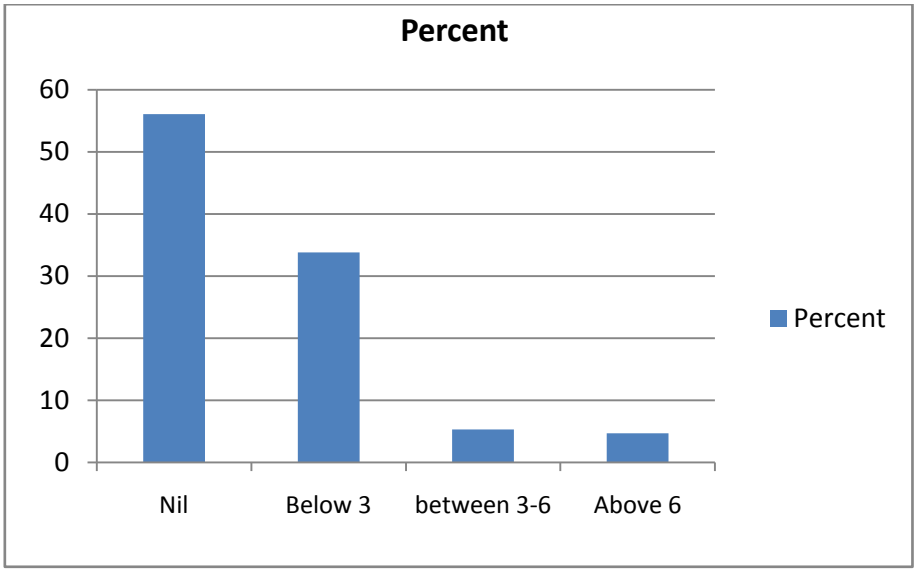


Figure 4.15: National level articles published by Teachers

Four hundred two (56.1%) of teachers have no national publications. Two hundred forty two (33.8%) teachers have less

than three publications, Thirty eight teachers have between three and six publications and thirty four teachers have above six publications.

4.1.16 Classification based on Self-rating of teachers

Table 4.16: Frequency Distribution of Self Rating as Teacher

Self-Rating as Teacher	Frequency	Percent
Average	204	28.5
Above Average	423	59.1
Excellent	89	12.4
Total	716	100.0

The teachers were asked to self rate their competence on a five point scale. Two hundred four teachers self rated themselves as average (28.5%), Four hundred twenty three teachers as above average (59.1%) and eighty nine teachers self rated them as excellent teachers (12.4%).

4.2 Measurement model

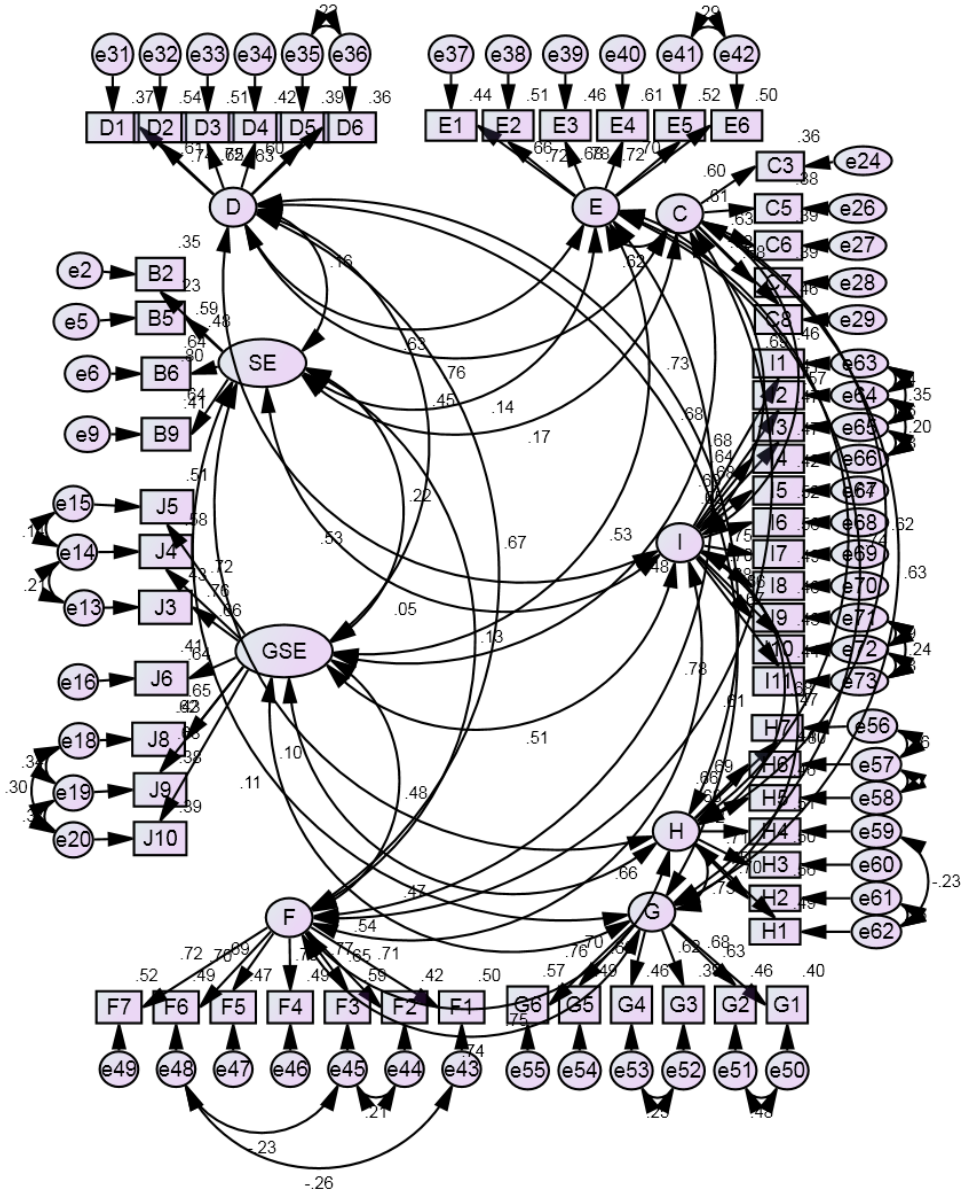


Figure 4.16: Measurement model

Table 4.17: Model Fit Summary of measurement model

Indices	Value	Suggested value
Chi-square value	3593.354	-
DF	1592	-
Chi-square value/DF	2.257	< 5.00 (Hair et al .,1998)
GFI	0.849	>0.90(HU and Bentler,1999)
AGFI	0.833	>0.90 (Hair et al ., 2006)
CFI	0.906	>0.90 (Hair et al.,2008)
NFI	0. 844	>0.90
RMSEA	0. 042	<0.08 (Hair et al ., 2006)

Confirmatory factor analysis (CFA)

CFA measures the extent to which the observed variables are generated by the underlying factors. This is acquired by a priori specification of relationship between the observed measures and the underlying factors. CFA measures the factorial structure of an instrument in order to determine the extent to which the items expected to measure a particular latent construct actually measures it. The aim of CFA is to link the observed and latent variables within the framework of structural equation modelling (SEM) and hence it is considered to be a measurement model. This measurement model is evaluated statistically to check the goodness-of-fit in the sample data (Anderson & Gerbing, 1988).

The measurement model consists of the items measuring the three constructs in the conceptual model. The construct self-esteem has ten items, general self-efficacy has ten items and competence has fifty two items under the seven sub-constructs. The measurement model is evaluated statistically in order to determine the goodness-of-fit for the sample data.

The values of fit measures are obtained for measurement model from the table 4.17. As per the table chi-squared is less than five, GFI is 0.849, AGFI is 0.833 and RMSEA is 0.042 all found to be well within the acceptable limits.

4.3 Reliability

The reliability is measured through Cronbach's alpha (Nunnally, 1978). These values are acceptable, if it is greater than or equal to 0.7.

Table 4.18: Cronbach's alpha values of the constructs

Factors	No. of statements before CFA	No. of statements after CFA	Cronbach Alpha
Self Esteem	10	4	0.716
Subject Knowledge	9	5	0.761
Student Evaluation	6	6	0.813
Update Academic Programs	6	6	0.862
Design Curriculum	7	7	0.869
Project Guidance	6	6	0.844
Administer lab and test	7	7	0.875
Career Counseling	11	11	0.911
General Self Efficacy	10	7	0.866

4.3.1 Construct reliability

Construct reliability is calculated by the method suggested by Fornell and Larcken (1981). It is the ratio between square of the sum of standardized factor loadings to the sum of standardized factor loadings and standardized error covariance.

Construct reliability = $(\sum \pi_i)^2 / (\sum \pi_i)^2 + (\sum \partial_{[})$

Where π_i represents the standardized factor loadings, ∂_I represents the standardized error variance (Fornell, C., & Larcker, 1981). The value is acceptable when it is greater than 0.7. The construct validity of self-esteem is 0.728 and general self efficacy is 0.849. The construct validity of competence dimensions are for subject knowledge is 0.765, student's evaluation is 0.818 update academic programmes is 0.860, design curriculum is 0.873, project guidance is 0.836, administer lab and test is 0.871 and career counselling is 0.905. All the values are found to be greater than 0.7. Hence the instruments used in the study have acceptable construct reliability values. The high value of construct reliability indicates that the construct is measured consistently using the latent variables.

4.3.2 Construct validity

Construct validity is the extent to which a set of observed variables represent the theoretical latent constructs they are expected to measure. It is measured through four components, They are face validity, convergent validity, discriminant validity and nomological validity (Churchill Jr, 1979). These methods evaluate the degree of convergence for a construct and also discriminates the indicators of other constructs and its own (Bagozzi, R. P., & Yi, 2012).

Face validity is implied as this study had used standardized and existing scales to capture the constructs.

4.3.3 Convergent validity

Three measures are used to measure convergent validity. They are factor loadings, average variance extract and construct reliability.

The standardised factor loadings are expected to be 0.5 in order to have acceptable convergent validity. From the confirmatory factor analysis results the factor loadings were found to be greater than 0.5and significant at p value less than 0.001. The lowest identified standardized factor loading among the items is 0.5 and the highest factor loading is 0.8.

Farnell and Larcker (1981) have suggested that average variance extract should be greater than 0.5 for each latent construct in the model to establish sufficient convergent validity. Average variance extract is calculated as the sum of the square of standardized factor loadings divided by the number of items for each latent variable. The average extracted variance values are provided in the table 4.19. All these values are found to be greater than 0.5. So, the instrument has acceptable convergent validity.

4.3.4 Discriminant validity

Discriminant validity for scales in the research is established by checking whether the square root of average variance extracted of a construct is greater than the inter-construct correlation between the construct and other constructs present in the model (Fornell & Larcker 1981).

Table 4.19: Composite reliability, convergent validity and discriminant validity

	CR	AVE	Se	c	D	e	f	g	H	i	Gse
Se	0.728	0.5089	0.639								
C	0.765	0.595416	0.027225	0.628							
D	0.818	0.53115	0.0256	0.473049	0.656						
E	0.860	0.507355	0.018769	0.0386884	0.395641	0.712					
F	0.873	0.50764	0.017424	0.0375769	0.451584	0.405284	0.705				
G	0.836	0.56053	0.011664	0.400689	.0.463761	0.552049	0.446121	0.678			
H	0.871	0.502698	0.01	0.300681	0.527076	0.413449	0.468516	0.4329	0.701		
I	0.905	0.565551	0.002916	0.0320356	0.279841	0.471969	0.436921	0.448025	0.4624	0.682	
gse	0.849	0.551389	0.046656	0.232324	0.200704	0.279841	0.225625	0.288369	0.224676	0.256036	0.671

Factors of Teacher Competence	Abbreviation
Self Esteem	**se -B**
General Self Efficacy	**g se - J**
Subject Knowledge	**C**
Evaluate Student's Performance	**D**
Update Academic Programs	**E**
Design Curriculum	**F**
Project Guidance	**G**
Administer Lab and Test	**H**
Career and Academic Counselling	**I**

The diagonal entries in the table 4.19 are the square root of average variance extract values of the constructs. These are greater than any inter-construct correlations as shown above. Hence it is established that the measurement model possess discriminant validity.

4.3.5 Nomological validity

Nomological validity is tested by examining whether the correlations between the constructs are as expected in the measurement model (Spiro R. L. & Weitz, 1990). From the above table 4.19 correlations between constructs are positive and significant at $p < 0.001$. Thus the inter-construct correlations are consistent with the conceptual model in relation to the hypotheses stated in the study. Hence nomological validity is established in the model.

4.3.6 Test for common method variance

Common method variance or the common method bias is the error which arise when data collected for dependent , independent and mediating variables are from the same respondent (Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, 2003). This study uses self-report data from the teachers of engineering colleges for self-esteem, general self-efficacy and competence. This bias is checked by Harman's single factor test. The principle behind this is that under situations of common method variance, there exists a single factor which can explain the majority of the covariance among the measures of the construct. To check this exploratory factor analysis is run in order to extract a single factor from all the measures and applied the unrotated factor solution to find the effect. Exploratory factor analysis test results proved that common method variance does not affect this study as the single factor extracted can explain only 27.636 percent of the variance, which is well below the cut-off of 50 percent (Podsakoff, P. M., & Organ, 1986).

The details are provided in below

Table 4.20: Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.898	27.636	27.636	19.898	27.636	27.636
2	3.726	5.175	32.811			
3	2.956	4.105	36.916			
4	2.273	3.157	40.073			
5	2.121	2.946	43.019			
6	2.039	2.832	45.851			

Table 4.20 Continued…

7	1.598	2.219	48.070			
8	1.494	2.075	50.146			
9	1.461	2.030	52.175			
10	1.329	1.846	54.021			
11	1.153	1.602	55.623			
12	1.117	1.551	57.174			
13	1.075	1.493	58.667			
14	1.038	1.441	60.108			
15	.973	1.352	61.460			
16	.965	1.340	62.800			
17	.919	1.276	64.077			
18	.904	1.256	65.333			
19	.858	1.191	66.524			
20	.815	1.132	67.656			
21	.793	1.101	68.757			
22	.776	1.078	69.835			
23	.761	1.057	70.893			
24	.750	1.041	71.934			
25	.725	1.006	72.941			
26	.707	.982	73.922			
27	.697	.969	74.891			
28	.673	.935	75.826			
29	.667	.926	76.752			
30	.640	.889	77.642			
31	.628	.873	78.514			
32	.615	.854	79.368			
33	.602	.835	80.204			
34	.594	.826	81.029			
35	.570	.791	81.821			
36	.561	.779	82.600			
37	.550	.764	83.364			
38	.532	.739	84.103			
39	.505	.702	84.805			
40	.490	.680	85.485			

Table 4.20 Continued…

41	.487	.676	86.162			
42	.472	.656	86.817			
43	.467	.649	87.466			
44	.446	.620	88.086			
45	.434	.603	88.689			
46	.420	.584	89.272			
47	.418	.580	89.853			
48	.411	.570	90.423			
49	.399	.554	90.977			
50	.387	.537	91.514			
51	.383	.533	92.046			
52	.354	.492	92.539			
53	.347	.482	93.021			
54	.343	.477	93.498			
55	.338	.469	93.967			
56	.321	.446	94.413			
57	.314	.436	94.849			
58	.302	.419	95.268			
59	.299	.416	95.684			
60	.287	.399	96.083			
61	.279	.387	96.470			
62	.279	.387	96.857			
63	.266	.369	97.226			
64	.256	.355	97.581			
65	.251	.349	97.930			
66	.243	.338	98.268			
67	.236	.328	98.596			
68	.231	.320	98.916			
69	.219	.304	99.220			
70	.196	.272	99.492			
71	.191	.266	99.757			
72	.175	.243	100.000			
Extraction Method: Principal Component Analysis.						

As suggested in literature the measurement model is assessed before the analysis of structural model (Anderson, J. C., & Gerbing, 1988). The analysis has shown good results for reliability, discriminant reliability, nomological reliability and convergent reliability. Hence the evolved measurement model proves to be a sound measurement model. Hence analysis can be further taken to the next level of structural model evaluations.

4.4 Friedman Test for significance difference among mean ranks towards factors of teacher competence

Table 4.21: Friedman test of ranks

Factors of Teacher competence	Mean Rank	Chi square value	P value
Subject Knowledge	4.16	320.871	0.001**
Evaluate Student's Performance	4.67		
Update Academic Programs	3.17		
Design Curriculum	3.96		
Project Guidance	3.78		
Administer Lab and Test	4.62		
Career and Academic Counselling	3.63		

Note: 1. ** denotes significant at 1 % level.

Since P value is less than 0.01, the null hypothesis is rejected at 1 percent of significance. Hence there is significant difference among mean ranks towards factors of teacher competence. Based on mean rank, evaluation of student's performance (4.67) is the most important factor in teacher competence, followed by administration of laboratory and test (4.62), subject knowledge of teachers (4.16), designing curriculum (3.96), project guidance (3.78), career and academic counseling (3.63) and update of academic programmes (3.17).

4.5 Test of Normality

Hypoyhesis

Null Hypothesis: The sample of self esteem, general self efficacy and competence follow a normal distribution.

Alternate Hypothesis: The sample of self esteem, general self efficacy and competence do not follow a normal distribution.

Table 4.22: Test of Normality

Factors	Mean	SD	KS z value	P value
Self Esteem	26.97	4.307	1.915	0.056
General Self Efficacy	32.11	4.814	1.893	0.058
Competence	166.19	17.929	1.935	0.083

Since all p values are greater than 0.05, the null hypothesis is accepted at 5 % level of significance. Hence it is concluded that the variables self esteem, general self efficacy and teacher competence follow normal distribution.

4.6 Mean and Standard deviation of factors of competence

They are shown in table 4.23

Table 4.23: Mean and SD of Factors of Teacher Competence

Factors of Teacher Competence	Mean	SD
Self Esteem	**15.47**	**3.94**
General Self Efficacy	**27.44**	**6.15**
Subject Knowledge	25.70	2.92
Evaluate Student's Performance	26.37	3.03
Update Academic Programs	24.55	3.97
Design Curriculum	29.69	4.16
Project Guidance	25.48	3.67
Administer Lab and Test	30.84	3.68
Career and Academic Counselling	45.58	7.10
Overall Teacher Competence	**208.22**	**22.92**

4.7 t- test

Alternate Hypothesis: There is significant difference between government and self-financing with respect to factors of teacher competence.

Table 4.24: t test for significant difference between government and self-financing with respect to factors of teacher competence.

Factors of Teacher Competence	Category of Institution				t value	P value
	Government		Self Financing			
	Mean	SD	Mean	SD		
Self Esteem	27.62	4.31	26.41	4.23	3.778	0.001**
General Self Efficacy	31.96	4.95	32.23	4.69	0.755	0.451
Subject Knowledge	25.95	2.72	26.04	2.92	0.438	0.661
Evaluate Student's Performance	21.96	2.46	22.13	2.51	0.892	0.373
Update Academic Programs	20.38	3.37	20.53	3.30	0.596	0.552
Design Curriculum	21.17	3.21	21.34	2.96	0.738	0.461
Project Guidance	20.84	3.42	21.23	2.98	01.623	0.105
Administer Lab and Test	21.86	2.86	22.07	2.66	0.987	0.324
Career and Academic Counselling	32.90	5.77	33.82	4.54	2.387	0.017*
Overall Teacher Competence	165.06	19.06	167.16	16.87	1.558	0.120

Note: 1. ** denotes significant at 1 % level.
2.* denotes significant at 5 % level

Since p value is less than 0.01, null hypothesis is rejected at 1 % level with regard to self-esteem on teacher competence. Hence there is significant difference between government and self-financing teachers with regard to the self- esteem on teacher competence. Based on the mean score, government teachers are better in self- esteem on teacher competence.

Since p value is less than 0.05, the null hypothesis rejected at 5 % level with regard to academic and career counselling of teachers in factors of teacher competence. Hence there is significant difference between government and self-financing teachers with regard, academic and career counselling of teachers in factors of teacher competence. Based on the mean score, self-financing teachers are better in academic and career counselling than government teachers in factors of teacher competence

There is no significant difference between government and self-financing teachers with regard, general self-efficacy, subject knowledge and skill, evaluate student's performance ,update of academic programmes, design curriculum, project Guidance, administer Laboratory and test, and overall teacher competence in factors of teacher competence, since P value is greater than 0.05. Hence null hypothesis is accepted with 5 % level with regard to general self-efficacy, subject knowledge and skill, evaluate Student's Performance, update of academic programmes, design Curriculum, project Guidance, and administer laboratory and test, in factors of teacher competence.

Chapter 5

VALIDATION OF THE CONCEPTUAL MODEL

Contents

In this chapter the conceptual model is validated by using structural equation modelling. The first order and second order structural equation modelling are also presented along with Mediation analysis.

5.1 Structural equation model

5.1.1 Introduction

Structural equation modelling is a general and powerful multivariate technique. It uses the conceptual model, path diagrams and system of linked regression path equations. It captures complex and dynamic relationships within the area where observed and unobserved variables are being used. Structural equation modelling may seem to be similar with regression but basically different from regression**.** In regression analysis there is a clear distinction between independent variable and dependent variable exists. In structural equation modelling such independent variable and dependent variable concepts applies only in relative terms. The dependent model in one

model equation becomes an independent in another model. This allows structural equation modelling to infer causal relationships.

Structural equation modelling involves endogenous and exogenous variables. Endogenous variables are dependent variable in at least one of the structural equation modelling equations. Such variables are termed as endogenous variables instead of response variable. They may become independent variables in other equations of structural equation modelling. Exogenous variables are throughout independent variables in the structural equation modelling. Structural equation modelling establishes the causal relationships among endogenous variables.

Structural equation models are represented by path diagrams. A path diagram has nodes representing the variables and arrows showing relationships among these variables.In conventions in a path diagram a latent variable can be represented as an ellipse or circle and observed variable are drawn as rectangle or square. To represent relationship arrows are used among the variables. Single headed arrow represents a causal relationship in that direction. Double headed arrow represents a reciprocal causal relationship. Curved arrows represent that there may exist relationship between the variables. Error terms are introduced and in the analysis they are connected by curved two headed arrows.

5.1.2 Test of hypotheses in structural equation modelling.

H1: There is a positive relationship between self esteem and general self efficacy.

H2: There is a positive relationship between general self efficacy and competence.

5.1.3 Hypothesised Model

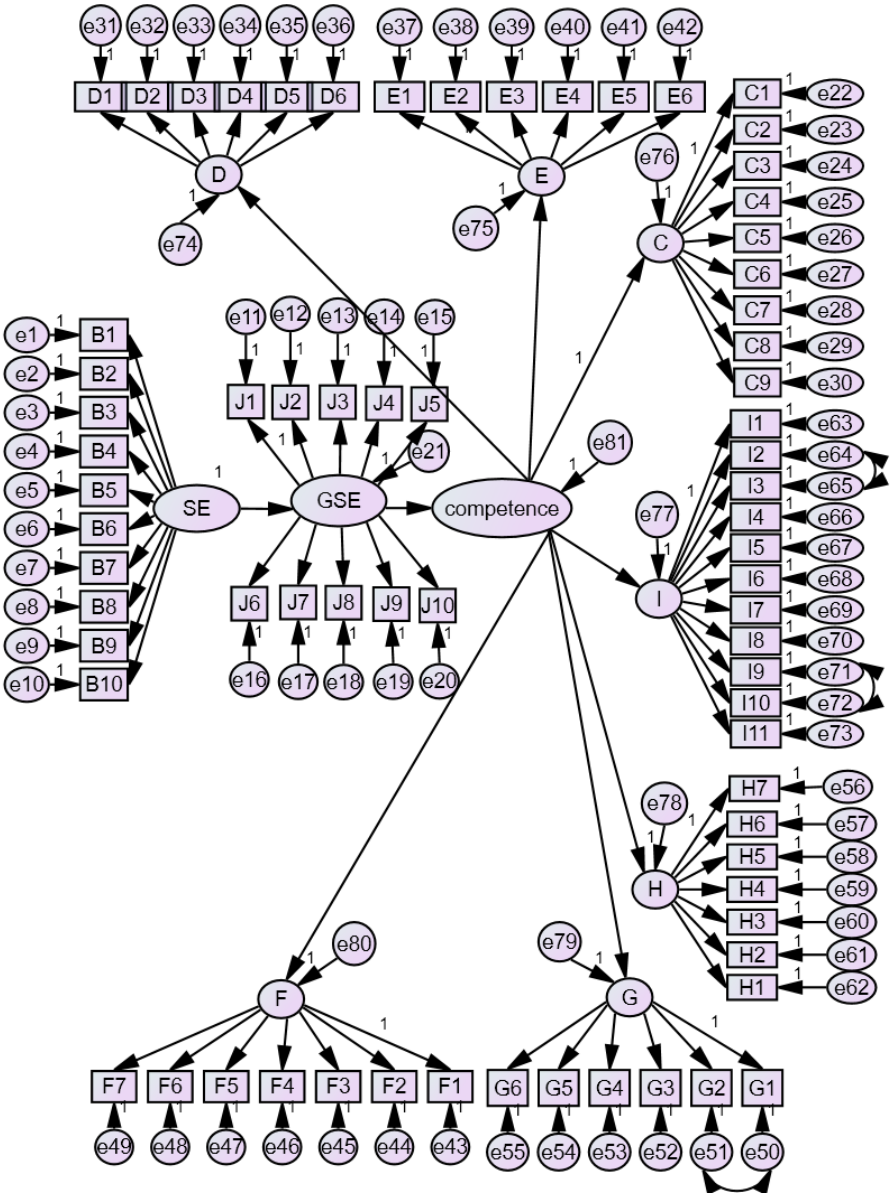


Figure 5.1: Hypothesised Model

Abbreviations used: SE =Self-esteem; GSE = General self-efficacy; C = Subject knowledge; D = Evaluation of student's performance; E = Update programmes; F = Design curriculum; G = Project guidance; H = Administer lab and test; I = Career counselling.

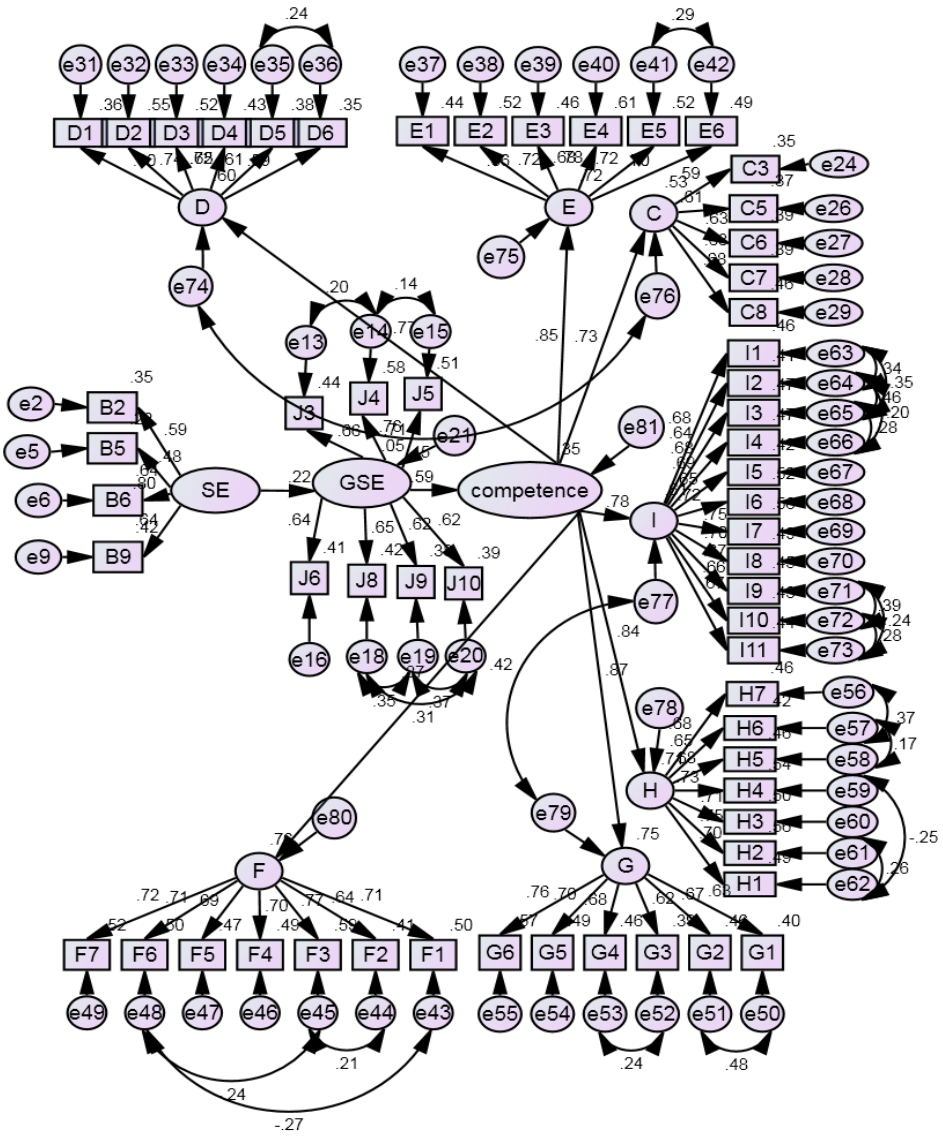


Figure 5.2: Conceptual Model

Note: Numbers given on the path are standardized factor loadings, squared multiple correlations and error co variances.

Abbreviations used: SE =Self-esteem; GSE = General self-efficacy; C = Subject knowledge; D = Evaluation of student's performance; E = Update programmes; F = Design curriculum; G = Project guidance; H = Administer lab and test; I = Career counselling.

5.1.4 Conceptual model

Table 5.1: Model Fit Summary of Structural Equation Model on teacher competence

Indices	value	Suggested value
Chi-square value	3679.990	-
DF	1617	-
Chi-square value/DF	2.276	< 5.00 (Hair et al .,1998)
GFI	0.846	>0.90(HU and Bentler,1999)
AGFI	0.831	>0.90 (Hair et al ., 2006)
CFI	0.903	>0.90 (Hair et al.,2006)
NFI	0. 840	>0.90
RMSEA	0. 042	<0.08 (Hair et al ., 2006)

As per the table 5.1 it is evident that higher the probability associated with chi-square value the closer the fit between hypothesised model and the perfect fit (Bollen, 1990). In other words, the hypothesised model has a good fit in this study with the sample data.

From the above table it is found that the calculated chi- square / df is 2.276 which is less than 5, indicate that the model is fit for teacher competence.

The most important aspect of using confirmatory factor analysis is to assess the model fit and quality of adjustment. This is not a commonly accepted issue by various authors. Various authors refer to different threshold values for accepting a good model fit for the sample data in the study. (e.g., Bollen (1990); Hu, L. T., & Bentler, (1999) ,where as other authors are less restrictive with the fit adjustments of the model.

Bollen (1990) delivers the RMSEA (Root mean square error of approximation) values as less than 0.08; GFI (Goodness of fit index), NFI (Normative fit index) and CFI (comparative fit index) values greater than 0.9 to be the acceptable limits. The authors Hu and Bentler prescribed for PCFI and PGFI values to be above 0.6 and RMSEA less than or near 0.6.The CFI and TFI values around 0.95 delivers a good adjustment for the structure model fit by the data. The AMOS manual (SPSS, 2006) prescribes CFI values greater than 0.9 and GFI values above 0.8.

The threshold values presented in the literature refer to excellent model fit for that sample data. This does not mean the values slightly below need to be excluded (Marsh, H. W., Hau, K. T., & Wen, 2004). The researcher should understand the value combination instead of excluding values from the analysis that are just slightly below the best model fit values (Howieson, 2008).

The adequacy of the model does not rely only on satisfying the global fit indices derived from the sample data used for developing a model. "Scientific progress could be impeded if fit coefficients (even appropriate ones) are used as the primary criterion for judging the adequacy of a model. Fit indexes yield information bearing only on the model's lack of fit. More importantly, they can in no way reflect the extent to which the model is plausible; this judgment rests squarely on the shoulders of the researcher. Thus assessment of the model adequacy must be based on multiple criteria that take into account theoretical, statistical, and practical considerations" (Sobel, M. E., & Bohrnstedt, 1985).

The results presented in the table 5.1 shows that model have reasonable indexes of adjustment. In general CFI, GFI indicators are close to 0.9 producing an acceptable threshold of 0.903 and 0.846. The RMSEA value is 0.042 well within the prescribed limits. The chi-squared /DF value shows 2.276 well within the acceptable limits. Hence this structural model for the sample date is a moderately acceptable model fit.

5.2 First order structural equation modelling for self-esteem

Self-esteem is the overall evaluation of one's personal worth or value (Rosenberg, 1965). Self-esteem develops in comparison with the self and other's competencies (Cotton, 1985). Self-esteem has been conceptualized by employees in understanding their special abilities and skills. Individuals with feelings and perceptions of high self-esteem have great hopes in succeeding at work. High self-esteem individuals would overcome the negative attitudes about their skills and ability (Dutton, K. A., 1997).

5.2.1 Establishing the relationship between self-esteem and its items

There are ten statements in Rosenberg self-esteem scale. Out of which four are remaining after the factor loadings values are checked. They are "At times, I think I am no good at all; I feel I do not have much to be proud of; I certainly feel useless at times and All in all I am inclined to feel that I am a failure". These four statements were found to have standardised regression weights greater the 0.5. Those statements with loading less than 0.5 were removed to improve the overall fit.

In line with this study it was found in another study the author investigates the relationship between global self esteem, academic self efficacy and academic performance in a sample of two hundred fifty five college students in Arab emirates. Confirmatory factor analysis had been performed using analysis of moment structures on global self-esteem scores. It revealed the relationship on positive and negative self esteem as hypothesized. In confirmatory factor analysis there are global self-esteem items with less than 0.05 factor loadings. Hence supports the confirmatory factor analysis in the present study as well (Afari, Ward, & Khine, 2012).

Table 5.2: Regression coefficients between Self esteem and its items

Self esteem	Estimate	Standardised regression weights	P	Result
B6 <--- Self Esteem	0.914	0.799	p<0.05	significant
B5 <--- Self Esteem	0.594	0.478	p<0.05	significant
B2 <--- Self Esteem	0.731	0.593	p<0.05	significant
B6 <--- Self Esteem	0.914	0.645	p<0.05	significant

5.3 First order structural equation modelling for general self- efficacy

General self efficacy of a person may influence the performance in a specified area of activity and motivation. Individuals with strong self efficacy beliefs tend take more risk and challenges in undertaking task. Those people with high self efficacy tend to fix their goals and also succeed in achieving the goals. Bandura (1997) established that self efficacy can be developed through observing master's task, self experience and through positive courage and outlook.

The German version of general self-efficacy scale was originally developed by Mattias Jerusalem and Ralf Schwarzer in 1979. This scale consists of ten items.

5.3.1 Establishing the relationship between general self efficacy and its items

The factor loadings for the construct general self efficacy are examined. There are ten items for the construct.

From the table it is evident that

Table 5.3: Regression coefficients between General self efficacy and its items

General self efficacy			Estimate	Standardised regression weights	P value	Result
J10	<---	General self efficacy	0.844	0.623	p<0.05	significant
J4	<---	General self efficacy	1.084	0.764	p<0.05	significant
J5	<---	General self efficacy	1.006	0.714	p<0.05	significant
J3	<---	General self efficacy	1.000	0.663	p<0.05	significant
J8	<---	General self efficacy	0.917	0.652	p<0.05	significant
J9	<---	General self efficacy	0.813	0.618	p<0.05	significant
J6	<---	General self efficacy	0.753	0.638	p<0.05	Significant

There are ten statements in Schwarz Jerusalem General self efficacy scale. Out of which seven are remaining after the check of factor loadings of the items. They are "It is easy for me to stick to my aims and accomplish my goals; I am confident that I could deal efficiently with unexpected events; Thanks to my resourcefulness, I know how to handle

unforeseen situations; I can solve most problems if I invest the necessary effort; When I am confronted with a problem, I can usually find several solutions; If I am in trouble, I can usually think of a solution; I can usually handle whatever comes my way". These seven statements were found to have standardised regression weights greater the 0.5. Those statements with loading less than 0.5 were removed to improve the overall fit.

Another study in line with the present study investigates the uni-dimensionality and factor structure on Schwarz Jerusalem general self-efficacy scale. This study supports the present study in terms of the factor loadings for the items which are seen as greater than 0.5 in general self-efficacy scale has been accepted. This study is conducted across twenty five countries by the author (Scholz, Doña, Sud, & Schwarzer, 2002).

5.4 First order structural equation modelling for competence

According to the authors Verma, Sarita and Paterson, Margo and Medves, (2006) "competencies in education create an environment that fosters empowerment, accountability, and performance evaluation, which is consistent and equitable. The acquisition of competencies can be through talent, experience, or training."

The engineering teacher's competence scale was developed by (Ninsiima, 2003). This scale consists of seven sub constructs with fifty two items on the whole. The sub-constructs are subject knowledge, evaluation of student's performance, update academic programmes, curriculum design, project guidance, administering laboratory and test and counselling activities.

5.4.1 Establishing the relationship between the sub-construct of competence, subject knowledge and its items

The factor loadings for the sub-construct subject knowledge are examined.

Table 5.4: Regression coefficients between subject knowledge and its items

Subject knowledge			Estimate	Standardised regression weights	Sig Value	Result
C3	<---	Subject Knowledge	1.000	0.593	p<0.05	significant
C5	<---	Subject Knowledge	1.245	0.612	p<0.05	significant
C6	<---	Subject Knowledge	1.240	0.627	p<0.05	significant
C7	<---	Subject Knowledge	1.182	0.628	p<0.05	significant
C8	<---	Subject Knowledge	1.169	0.681	p<0.05	significant

From the table it is evident that there are nine statements in subject knowledge of teacher's competence scale. Out of which five are remaining after the check of factor loadings of the items. They are "Encourage and facilitate student learning of modern engineering concepts and practices, Attend to students vocational / career needs, Prepare scheme of work and lesson plans, Demonstrate and conduct laboratory and workshop work, Identify and select appropriate teaching and learning resources/materials." These five statements were found to have standardised regression weights greater the 0.5. Those statements with loading less than 0.5 were removed to improve the overall fit. From the table it is seen that the regression weight scores are highest for the

statement "Identify and select appropriate teaching and learning resources/materials."

5.4.2 Establishing the relationship between evaluation of students and its items

The factor loadings for the sub-construct evaluation of students' performance are examined.

Table 5.5: Regression coefficients between evaluation of students and its items

Evaluation of students			Estimate	Standardised regression weights	P value	Result
D1	<---	Evaluation of students	1.000	0.604	p<0.05	Significant
D2	<---	Evaluation of students	0.918	0.740	p<0.05	Significant
D3	<---	Evaluation of students	1.019	0.721	p<0.05	Significant
D4	<---	Evaluation of students	0.973	0.653	p<0.05	Significant
D5	<---	Evaluation of students	0.797	0.614	p<0.05	Significant
D6	<---	Evaluation of students	1.025	0.589	p<0.05	Significant

There are six statements in the sub-construct of evaluation of students in the engineering teacher's competence scale. All the six are remaining after the check of factor loadings of the items. They are "formulate and develop the marking guide, ratings and grades, evaluate students' performance, record and maintain a progressive record of students' performance, provide clear workshop and laboratory work instructions, set, invigilate and mark examinations every semester and compute the cumulative grade point average of the examination results". These six statements were found to have standardised regression weights greater the 0.5. From the table it is seen that the regression weight scores are the highest for the statement "evaluate students' performance"

5.4.3 Establish the relationship between update academic programmes and its items

The factor loadings for the sub-construct Update academic programmes is examined.

Table 5.6: Regression coefficients between update academic programmes and its items

Update academic programmes			Estimate	Standardised regression weights	P value	Result
E.1	<---	Update academic programmes	1.000	0.665	p<0.05	significant
E.2	<---	Update academic programmes	1.013	0.718	p<0.05	significant
E.3	<---	Update academic programmes	1.192	0.680	p<0.05	significant
E.4	<---	Update academic programmes	1.189	0.779	p<0.05	significant
E.5	<---	Update academic programmes	1.153	0.723	p<0.05	significant
E.6	<---	Update academic programmes	1.116	0.703	p<0.05	significant

There are six statements in the sub-construct of update academic programmes in the engineering teacher's competence scale. All the six are remaining after the check of factor loadings of the items. They are "design plan, organise and implement programmes and courses, ensure that all resources, including space, lecturers and technology are used efficiently, innovative in terms of market- driven programmes to keep and attract students, maintain quality and high standards of the programmes to keep and attract students, participation in decision- making and team work and initiate and manage change". These six statements were found to have standardised regression weights greater the 0.5. From the table it is seen

that the regression weight scores are highest for the statement "maintain quality and high standards of the programmes to keep and attract students"

5.4.4 Establish the relationship between designing curriculum and its items

The factor loadings for the sub-construct Designing curriculum is examined.

Table 5.7: Regression coefficients between designing curriculum and its items

Designing curriculum			Estimate	Standardised regression weights	P value	Result
F1	<---	Designing curriculum	1.000	0.708	p<0.05	significant
F2	<---	Designing curriculum	0.796	0.642	p<0.05	significant
F3	<---	Designing curriculum	1.007	0.771	p<0.05	significant
F4	<---	Designing curriculum	0.979	0.701	p<0.05	significant
F5	<---	Designing curriculum	0.930	0.687	p<0.05	significant
F6	<---	Designing curriculum	0.972	0.705	p<0.05	significant
F7	<---	Designing curriculum	0.981	0.718	p<0.05	significant

There are seven statements in the sub-construct of designing curriculum in the engineering teacher's competence scale. All the seven are remaining after the check of factor loadings of the items.. They are "determine, organise and implement the curriculum, create and maintain an environment and code of behaviour that promotes and secures good teaching, effective learning and high standards of achievement, manage and organise resources effectively and efficiently to meet the needs of the curriculum, set the objectives of the curriculum and courses, determine the teaching loads, develop assessment tools and communicate about curriculum to staff and students". These seven statements were found to have standardised

regression weights greater the 0.5. From the table it is seen that the regression weight scores are highest for the statement "manage and organise resources effectively and efficiently to meet the needs of the curriculum."

5.4.5 Establish the relationship between project guidance and its items

The factor loading of the sub-construct of competence project guidance is examined.

Table 5.8: Regression coefficients between project guidance and its items

Project guidance	Estimate	Standardised regression weights	P value	Result
G1 <--- Project guidance	1.000	0.633	p<0.05	significant
G2 <--- Project guidance	1.094	0.675	p<0.05	significant
G3 <--- Project guidance	1.378	0.623	p<0.05	significant
G4 <--- Project guidance	1.403	0.679	p<0.05	significant
G5 <--- Project guidance	1.169	0.698	p<0.05	significant
G6 <--- Project guidance	1.384	0.755	p<0.05	significant

There are six statements in the sub-construct of project guidance in the engineering teacher's competence scale. All the six are remaining after the check of factor loadings of the items. They are "develop and supervise student's projects, test, mark and score the projects, identify, lobby and place students for industrial training, create and promote good public relations with industrialists / employers, counsel and guide students and assess and evaluate projects and industrial training ". These six statements were found to have standardized regression weights greater the 0.5. From the table it is seen that the regression weight scores are highest for the statement "assess and evaluate projects and industrial training."

5.4.6 Establish the relationship between administer laboratory and test and its items

The factor loadings for the sub-construct Administer lab and test of competence is examined.

Table 5.9: Regression coefficients between administer laboratory and test and its items

Administer laboratory and test	Estimate	Standardized regression weights	P value	Result
H7 <--- Administer laboratory and test	1.000	0.677	p<0.05	significant
H6 <--- Administer laboratory and test	0.910	0.651	p<0.05	significant
H5 <--- Administer laboratory and test	0.948	0.680	p<0.05	significant
H4 <--- Administer laboratory and test	1.235	0.733	p<0.05	significant
H3 <--- Administer laboratory and test	1.102	0.711	p<0.05	significant
H2 <--- Administer laboratory and test	1.094	0.748	p<0.05	significant
H1 <--- Administer laboratory and test	0.913	0.700	p<0.05	significant

There are seven statements in the sub-construct of administer laboratory and test in the engineering teacher's competence scale. All the seven are remaining after the check of factor loadings of the items. They are "plan and analyse assignments and test items, formulate and develop the marking guide and score the assignments, tests, and workshop and laboratory exercises, prepare a scheme of work, write standard test items, prepare and provide clear instructions for assignments, tests, and workshop and laboratory exercises, invigilate and mark examinations and compute scores and grade candidates". These seven statements were found to have standardized regression weights greater the 0.5. From the table it is seen that the regression weight scores are highest for the

statement "formulate and develop the marking guide and score the assignments, tests and workshop and laboratory exercises".

5.4.7 Establish the relationship between academic and career counselling activities and its items

The factor loadings for the sub-construct Counselling activities of competence is examined.

Table 5.10: Regression coefficients between counselling activities and its items

Academic and career Counselling activities			Estimate	Standardised regression weights	P value	Result
I1	<---	Academic and career Counselling activities	1.000	0.675	p<0.05	significant
I2	<---	Academic and career Counselling activities	1.042	0.637	p<0.05	significant
I3	<---	Academic and career Counselling activities	1.082	0.684	p<0.05	significant
I4	<---	Academic and career Counselling activities	1.042	0.685	p<0.05	significant
I5	<---	Academic and career Counselling activities	1.106	0.647	p<0.05	significant
I6	<---	Academic and career Counselling activities	1.075	0.722	p<0.05	significant
I7	<---	Academic and career Counselling activities	1.123	0.747	p<0.05	significant
I8	<---	Academic and career Counselling activities	1.012	0.701	p<0.05	significant
I9	<---	Academic and career Counselling activities	0.974	0.672	p<0.05	significant
I10	<---	Academic and career Counselling activities	0.872	0.658	p<0.05	significant
I11	<---	Academic and career Counselling activities	0.966	0.666	p<0.05	significant

There are eleven statements in the sub-construct of counselling activities in the engineering teacher's competence scale. All the eleven are remaining after the check of factor loadings of the items. They are

"provide career guidance and counselling, delegate the guidance and counselling responsibility, avail space and time for guidance and counselling, identify and provide all the relevant programmes offered by the departments, counsel fellow lecturers who need assistance, guide students on how to succeed in their career, invite resourceful persons in the relevant professions to talk to students, talk to students who exhibit peculiar behaviours, generating knowledge by research is an integral part of a teacher, application of available knowledge should be an integral part of teaching/consultancy and popularising the subject/Extension of the subject by introducing new subjects". These eleven statements were found to have standardised regression weights greater the 0.5. From the table it is seen that the regression weight scores are highest for the statement "invite resourceful persons in the relevant professions to talk to students".

The author furnishes the factor loadings of the items of the engineering teacher competence scale in his study. Hence supports the present study by establishing the factor loadings greater than 0.5 (Kagaari & Munene, 2007).

5.5 Second order structural equation modelling

5.5.1 Establish the relationship between self-esteem and general self-efficacy

The factor loading for the construct Self esteem to General self efficacy is examined.

From the table it is evident that

Table 5.11: Regression coefficients between Self esteem and General self efficacy

Construct	Estimate	Standardised regression weights	P value	Result
General self efficacy <--- Self esteem	0.139	0.219	p<0.05	significant

The regression coefficients are found to be 0.219 for self-esteem to General self-efficacy.

Here the coefficient of self-esteem is 0.139 represents the partial effect of perception on general self-efficacy, holding the other variables as constant. The estimated positive sign implies that such effect is positive that general self-efficacy would increase by 0.139 for every unit increase in self-esteem and this coefficient value is significant at 1% level.

Hence hypothesis one that there exists a positive relationship between self esteem and general self efficacy is accepted.

Establish the relationship between general self-efficacy and competence

The factor loading for the construct General self efficacy to competence is examined

Table 5.12: Regression coefficients between General self efficacy and competence

Construct	Estimate	Standardised regression weights	P value	Result
Competence <--- General self efficacy	0.242	0.595	p<0.05	significant

The regression coefficient is found to be 0.595 for general self-efficacy to competence which is greater than 0.5 quite acceptable value. Here the coefficient of general self-efficacy is 0.242 represents the partial effect of perception on general self-efficacy, holding the other variables as constant. The estimated positive sign implies that such effect is positive that competence would increase by 0.242 for every unit increase in general self-efficacy and this coefficient value is significant at 1% level.

H2: There is a positive relationship between general self efficacy and competence

Hence hypothesis two is accepted. In other words there is a positive relationship between general self-efficacy and competence.

5.5.2 Establish the relationship between competence and its dimensions

The factor loading for the construct competence to the sub dimensions of competence are examined.

Table 5.13: Regression coefficients between competence and its dimensions

Construct			Estimate	Standardised regression weights	P value	Result
Subject knowledge	<---	Competence	1.000	0.727	p<0.05	significant
Evaluation of student's performance	<	Competence	1.417	0.772	p<0.05	significant
Update academic programmes	<	Competence	1.806	0.848	p<0.05	significant
Design curriculum	<	Competence	1.992	0.874	p<0.05	significant
Project guidance	<	Competence	1.484	0.866	p<0.05	significant
Administer laboratory and test	<	Competence	1.539	0.841	p<0.05	significant
Academic and career counselling activities	<	Competence	1.767	0.778	p<0.05	significant

From the table it is seen that the regression weight scores of the competence dimension is the highest for the sub-construct designing curriculum. The regression coefficient is found to be 0.727 for competence to subject knowledge, which is greater than 0.5. The regression coefficient is found to be 0.727 for competence to evaluation of students' performance, which is greater than 0.5, the regression coefficient is found to be 0.772 for competence to update academic programmes, which is greater than 0.5. The regression coefficient is found to be 0.848 for competence to design curriculum, which is greater than0.5. The regression coefficient is found to be 0.874 for competence to project guidance, which is greater than 0.5. The regression coefficient is found to be 0.866 for competence to administer lab and test, which is greater than 0.5. The regression coefficient is found to be 0.841 for competence to career counselling activities, which is greater than0.5

Here the coefficient of competence is 1.000 represents the partial effect of perception on subject knowledge of teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that subject knowledge of teachers would increase by 1.000 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.417 represents the partial effect of perception on evaluation of student's performance by teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that evaluation of student's performance by teachers of teachers would increase by 1.417 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.806 represents the partial effect of perception on update academic programmes of teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that update academic programmes of teachers would increase by 1.806 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.992 represents the partial effect of perception on design curriculum by teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that design curriculum by teachers would increase by 1.992 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.484 represents the partial effect of perception on project guidance by teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that project guidance by teachers would increase by 1.484 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.539 represents the partial effect of perception on administer laboratory and test by teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that administer laboratory and test by teachers would increase by 1.539 for every unit increase in competence and this coefficient value is significant at 1% level.

Here the coefficient of competence is 1.000 represents the partial effect of perception on academic and career counselling activities by

teachers, holding the other variables as constant. The estimated positive sign implies that such effect is positive that academic and career counselling activities by teachers would increase by 1.000 for every unit increase in competence and this coefficient value is significant at 1% level.

5.6 Mediation Analysis

In mediation analysis there are three types of variables. They are independent variable, mediator variable and dependent variable. In the research study it is valuable to identify and study the working pattern of the mediator variable and the way it achieves its effect on the dependent variable. Mediation analysis is used to get a deep understanding about the conceptual model. Mediation analysis tested through structural equation modelling is suggested as a powerful tool as it takes into consideration the latent variables (Baron, R. M., & Kenny, 1986).

5.6.1 Tests of hypotheses in mediation analysis

In the research model self-esteem is the independent variable, general self-efficacy is the mediator and competence is the dependent variable.

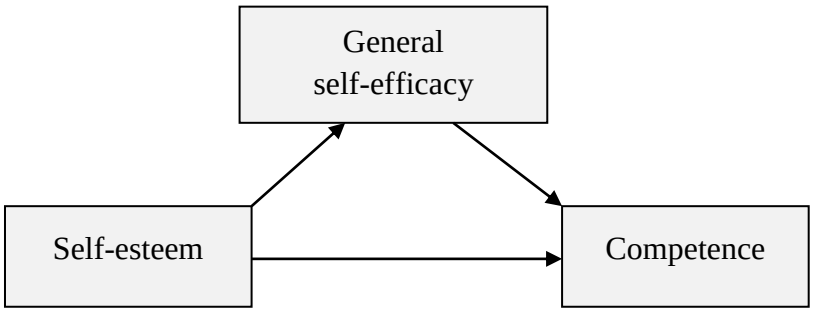


Figure 5.3: Path diagram showing the causal relationships among the three variables

The hypotheses to be tested in the study shown in the figure are as follows;

H3: Self esteem has direct and significant effect on competence (Direct effect)

H4: Self-esteem has direct and significant effect on general self efficacy (Indirect effect)

H5: General self-efficacy has positive and significant effect on competence (Indirect effect)

5.6.2 Results of mediation analysis

Table 5.14: The estimates are shown in the table below

Hypotheses	Direct effect	Indirect effect	Results
se ⟶ gse ⟶ com	0.017 (ns)	0.128**	Full mediation.

** = p<0.01;ns = "not significant"

Abbreviations: se = "Self-esteem"; gse = "general self efficacy"; com = "competence"

From the table the direct effect has a value 0.017 which is not significant at 0.01 levels. Hence hypothesis three that self esteem has direct and significant effect on competence (Direct effect) is not accepted. The value of indirect effect is 0.128 and significant at 0.01 levels. Hence hypothesis four that self-esteem has direct and significant effect on general self efficacy (Indirect effect) and hypothesis five that general self-efficacy has positive and significant effect on competence (Indirect effect) are accepted.

Chapter 6

FINDINGS, INTERPRETATION AND IMPLICATION OF THE STUDY

Contents

This chapter discusses the results of the analyses in the previous chapter in the light of objectives and related hypotheses. It closes with the implications and contributions of the study to the research area.

6.1 Research findings and discussions on Competence

First objective:

The first objective was to examine the relationship between self-esteem and general self-efficacy.

H1: There is positive relationship between self esteem and general self efficacy.

Result:

It is proved that there is positive relationship between self esteem and general self efficacy ($p<0.05$).

6.1.1 Self-esteem and general self-efficacy

The relationship between self-esteem and general self efficacy was shown positive in this study.

The necessary component identified in positive healthy self-esteem was high self-efficacy (Bowles, S., Gintis, H., & Osborne, 2001)**.** Research in the past has established that self-esteem is related with self-efficacy.

The items - SE2, SE5, SE6 and SE9 in section B of the questionnaire reflect confidence and self-worthiness of the engineering college teachers (Appendix). The items project the good and proud feeling of their self by themselves, useful to achieve competence in their profession. The results of this study agree with the research by Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, (1982).

If an individual feels lack of love and respect from others, he or she may not feel positive about the self and may not develop a positive image (Pajares, 1997; Schunk, 1990).

Such results support the theory of core self evaluations. Locke, E. A., McClear, K., & Knight, (1996) noted that "A person with high self-esteem will view a challenging job as a deserved opportunity which one can master and benefit from, where as a person with low self-esteem is more likely to view it as an undeserved opportunity or a chance to fail".

The result of the present study is similar to the result of the earlier research in self-esteem and self-efficacy relating to the role of competence in achieving success in a job which states that individuals

with high self-esteem maintain high general self-efficacy in the face of failure which motivates the individuals attain future success in their job (Dodgson, P. G., & Wood, 1998).

Self-consistency theory hypothesises that individuals are motivated and behave consistently in accordance with the display of their self-image. The theory pronounces that individuals with high self-esteem will effectively perform in their job to display their positive image (Korman, 1970).

In one of the studies, the authors found that although the positive and negative self-esteem are distinct, they are found to be related to self-efficacy (Ang, R. P., Neubronner, M., Oh, S. A., & Leong, 2006 ; Owens, 1994).

It was also found that negative self-esteem was weakly correlated to academic self-efficacy and was not found to be statistically significant (Dodgson, P. G . & Wood 1998).

Ang et al., (2006) have studied and proved that positive self-esteem was significant predictor of high self-efficacy, while negative self-esteem did not establish to be a significant predictor of self-efficacy.

Individuals who believe to succeed in a certain task, usually do not experience negative thoughts about their ability to perform in a task successfully (Bandura 1997; Chemers, M. M., Hu, L. T., & Garcia, 2001).

Past research showed a positive and significant correlation between self efficacy and general self efficacy of teachers. Similarly, positive and

significant strong correlation was seen in bi variate correlation analysis between efficacy and self-esteem of teachers. Self-esteem and general self-efficacy also showed positive and significant strong correlation. The interaction effect of self-esteem and general self-efficacy on teacher efficacy was not seen to be significant. But, there existed strong correlation between general self efficacy and self-efficacy of the teacher (Khan, Fleva, & Qazi, 2015).

There is always a positive direct relationship between self-esteem and personal efficacy (Kohn, 1994).

Generally self-esteem is used to measure well- being and positive or negative feeling about self. While self-efficacy had always been a predictor of behaviour, it had also always influenced competent motivation. Self-esteem is a permanent internal feeling developed from childhood through school and home environments. But self- efficacy is a feeling that depends upon competence and performance (Wenzel S.L., 1993).

One of the factors that self-esteem determines is the belief in one's ability to change a given situation to perform a task successfully (Branden, 1971).

The analysis in this research has established a positive significant relationship between self-esteem and general self-efficacy**.** It means that engineering teachers who have high self-esteem had high general self-efficacy. Hence the hypothesis that there is positive relationship between self esteem and general self efficacy is accepted.

Since p value is less than 0.01, and as the null hypothesis that there is no significant difference in the self-esteem of teachers in the government and private engineering colleges is rejected at 1 % level with regard to self-esteem on teacher competence, it could be interpreted that there is significant difference between teachers of government and private engineering colleges with regard to the construct of Self- esteem. Based on the mean score, government teachers are better in self- esteem on teacher competence.

Hence focus has to be on self-esteem enhancement programmes which can further aid the social and academic development of the teachers, which in turn enhances their general self-efficacy.

6.1.2 General self –efficacy and competence

Second objective:

The second objective was to understand the relationship between general self-efficacy and competence.

H2: There is a positive relationship between general self efficacy and competence.

Result:

This research study established a positive significant relationship between general self-efficacy and competence. This means that engineering teachers who had high general self-efficacy had high level of competence. Hence hypothesis two is accepted ($p < 0.05$).

Earlier research showed that self-efficacy influence academic performance, competence, motivation, learning and achievement (Pajares, 1997; Schunk, 1990).

The present study was found in line with previous studies. According to social cognitive theory, self-efficacy of a teacher is influenced by their professional behaviour (Albert Bandura & Adams, 1977).

In control theory, the authors suggest that when performance of individuals is below standard, they exert additional effort to achieve the performance goals, decrease their standard levels or withdraw from the task fully (Lord, R. G., & Hanges, 1987).

Another finding from the past research is that self-efficacy is a powerful tool in predicting the achievement of students. (Al-Harthy, I. S., Was, C. A., & Isaacson, 2010)**.** In this study, it is found that general self-efficacy is a powerful tool in predicting the competence for achievement of engineering college teachers.

Learned helplessness theory shows relationship between positive self-evaluation and job performance. This model explains that when individuals face unfavourable situation, individuals with positive self-esteem are less likely to display motivational deficits. This means individuals with positive self-esteem may show less of withdrawal behaviour and more of dedication and commitment at work. Individuals with pessimistic orientation may display less motivated behaviours at work. Finally, people with low self-esteem tend to either lower their efforts or completely withdraw from the task entirely (Peterson, C., & Seligman, 1984).

This study reveals that general self-efficacy is a strong predictor of competence of teachers in their performance similar to the result of the previous study which established that the strongest predictor of performance is self-efficacy. Hence self-theories play a major role in understanding the relationship between self esteem and self- efficacy that influence competence for performance (Paulsen, M. B., & Gentry, 1995).

From the past studies it was found that coaching leadership self-efficacy scale was positively related to coach competence scale. Hence from this finding it is evident that self-efficacy influences competence (Moen & Federici, 2012).

For the past four decades studies have explained the effects of psychological factors on human performance. Self-efficacy is identified as an important factor influencing success in different domains of human activity (Grant, T., Grant, A. M., & Greene, 2003; Marsh, 1993; Bandura, 1993).

Self-efficacy is connected to all the behaviour based outcomes such as engagement, persistence, reduced anxiety, stress and performance (Bandura, 2002). Hence self-efficacy beliefs are at the foundations of social cognitive theory.

The previous study has indicated that teachers with high positive self-efficacy beliefs about their teaching competence are more likely to face risks and use new teaching methods (Guskey, 1988).

Earlier research with teachers has resulted to show that teachers with high self-efficacy try to explore more alternative methods of

instruction, find out improved teaching methods and use experimental methods for teaching learning process (Allinder, 1994).

Self-efficacy judgements have been found to be a predictor of performance across a range of tasks and behaviours (Stajkovic, A. D., & Luthans, 1998).

Past investigation related teacher self-efficacy with teacher effectiveness in the academic set up. Self-efficacy plays a vital force in enhancing competence and thus contributing to teacher's professional development (Bray-Clark, N & Bates, 2003). Our present finding is in accordance with the past findings.

One of the earlier studies investigated the relationship between self-efficacy of teachers and their personality dispositions. The objective of the study was to identify some personality factors that act as predictors of their self-efficacy. Results showed self-efficacy of teachers to be high and strong. In the dimension connected with class room instruction, self-efficacy was found to be high. When analysed the Big five personality traits, conscientiousness and openness were found to be predicted high by self-efficacy of teachers (Djigić, Stojiljković, & Dosković, 2014).

The characteristics of a competency model of lecturers was explained by Qiuyan & Qin, (2009) in his research paper "Analysis on the competency model of the lecturers in the application oriented university". He adds that the strategy of application oriented universities should offer applied research, education and training for the regional economic and social development based on the continuous flexible lifelong learning

process. He further discusses the role change of lecturers from being a mere motivator and provider of knowledge to a knowledge creator, disseminator and practitioner in modern times. The responsibilities undertaken by them are becoming more complex. The lecturers are expected to undertake academic researches, curriculum development, professional competency assessment, enterprise co-operative education, social services, guiding students on projects and giving career counselling for students. The lecturers should move towards achieving multi-dimensionality of the professional knowledge in the theoretical and practical levels in the teaching -learning process. The teachers are expected to possess elements of competence as education, information processing, academic research, social service, innovation, self-improvement and personal development. Moreover, personal character of the lecturer was expected to have excellence in emotion management, willpower, reasonable philosophy, stable ethical views and superior performance. This paper further suggests the four dimensions of competencies such as personal quality, educative competency, research and development competency and collaborative competency as the important dimensions of competency frame work. This study has not included the counselling activities given by teachers to students.

The components of competence of engineering college teachers under seven dimensions are described below.

1) Providing subject knowledge
2) Evaluating performance of students
3) Updating academic program

4) Designing curriculum
5) Providing project guidance
6) Administering laboratory and test
7) Providing academic and career counseling

The first dimension of *subject knowledge* of teachers include encouraging or motivating students to learn the modern concepts, attending to career needs of students, demonstrating laboratory work and identifying appropriate teaching and learning resources for students. Each item in this component is significant and regression weights is found to be greater than 0.5 ($p < 0.05$). It means that component one is a good indicator to measure the competence of teachers in engineering colleges. Hence, it is inferred that teachers in engineering colleges possess competence in component one.

The second dimension of *evaluation of performance of students* by teachers include marking guides and grades, maintaining records, providing clear laboratory and test instructions, invigilating the semester examinations and computing the cumulative grades of students. These items are significant at $p<0.05$ and the regression weights of all the items in this dimension are found to be greater than 0.05. Therefore, the study showed that the teachers in engineering colleges possess competence in component two.

The third dimension of *updating academic programs* includes designing, planning, organizing and implementing academic programs, efficiently using technology and physical resources, introducing market

driven courses, maintaining high standards and initiating and managing change. These items are significant at $p<0.05$ and the regression weights of all these items in this dimension are found to be greater than 0.05. Therefore, the study showed that the teachers in engineering colleges possess competence in component three.

The fourth dimension of competence is *designing curriculum.* This includes organizing and implementing curriculum, promoting good teaching, providing effective learning, ensuring high standards of achievement goals, ensuring effective management of resources, determining teaching loads and deciding assessment tools. These items are significant at $p<0.05$ and the regression weights of all the items in this dimension are found to be greater than 0.05. Therefore, the study showed that the teachers in engineering colleges possess competence in component four.

The fifth dimension of competence of teachers is providing *project guidance*. This includes developing projects, supervising projects, evaluating projects, placing students for industrial training and promoting relations with industries. These items are significant at $p<0.05$ and the regression weights of all the items in this dimension are found to be greater than 0.05. Therefore, the study showed that the teachers in engineering colleges possess competence in component five.

The sixth dimension of competence of teachers is *administering laboratory tests*. This includes planning of tests and assignments, formulating the marking of guide for assignments, conducting laboratory exercises and tests. These items are significant at $p<0.05$ and the

regression weights of all the items in this dimension are found to be greater than 0.05. Therefore, the study showed that the teachers in engineering colleges possess competence in administering laboratory tests.

The seventh dimension of competence of teacher is *academic and career counseling*. This includes providing career guidance, counseling in academics and holding up-right morals in line with engineering professional practices and ethics. These items are significant at $p<0.05$ and the regression weights of all the items in this dimension are found to be greater than 0.05. It means that component seven is a good indicator to measure the competence of teachers in engineering colleges. Hence, it is inferred that teachers in engineering colleges possess competence in academic counseling.

In the t- test, since p value is less than 0.05, the null hypothesis is rejected at 5 % level with regard to career and academic counselling of teachers in the component of competence. Hence there is significant difference between government and private engineering college teachers in respect of the component- *career and academic counselling*. Based on the mean score, teachers in private engineering colleges are better in career and academic counselling than that of the teachers in the government engineering colleges.

In one of the past studies, the relationship between self-efficacy of school counsellor and perceived multicultural competencies were examined. The study demonstrated that counsellor's self-efficacy was statistically significant predictor of all three multicultural competences

namely terminology, knowledge and awareness about counselling. This exhibits that self-efficacy influences the performance of the individual in terms of counselling behaviours (D. Owens, Bodenhorn, & Bryant, 2010).

6.1.3 Mediation Analysis of general self-efficacy between self-esteem and competence.

Third objective:

The third objective was to test the mediating role of general self-efficacy on the relationship between self-esteem and competence.

H3: Self-esteem has direct and significant effect on teacher competence.

H4: Self-esteem has direct and significant effect on general self-efficacy.

H5: General self-efficacy has a positive and significant effect on competence.

Result:

The results of mediation analysis show full mediation occurring between self-esteem and competence through general self-efficacy. It means that there is no role of self-esteem to influence competence without general self-efficacy**.** It has established that general self-efficacy is a significant variable to the research in building competence in teachers. Hence hypothesis four and five were accepted. Variance of Self-esteem explains competence through general self-efficacy and only the indirect effects are significant through bootstrapping. Hence there is no direct role for self-esteem on competence. Only through general self-efficacy, self-esteem explains the variance in competence.

The Importance of self-efficacy in different situations was explained in the research. Self-efficacy has a role in improving job performance and improving low self-esteem and stress levels (Aloe, A. M., Amo, L. C., & Shanahan, 2014, Hsia, J. W., Chang, C. C., & Tseng, 2014, Kim, J., & Park, 2015).

This study indicates that there is a need to reinforce teacher's general self-efficacy of teachers so that teachers acquire higher competence levels in teaching-learning process and hence contributes to policy making to educational institutions. It is implied that if general self-efficacy of teachers is improved, then it may in turn influence the competence of teachers.

Some of the earlier studies failed to prove the positive relationship between self-esteem and job performance. The authors Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, (2003) after reviewing large number of studies were doubtful about the positive relationship between self-esteem and performance and noted that "it is difficult to draw from causal conclusions about self-esteem and other aspects of job or task performance. Overall, there was a weak positive co-relations between job performance and self-esteem. But, these may be due to in whole or in part either to successful performance improving self-esteem or to self report biases. There is no strong evidence indicating specifically that high self-esteem leads to improved performance on the job".

Although the connectivity between self-esteem and job performance was not dealt with in this study, as competence is the threshold of performance, the full mediation of general self-efficacy on competence has to be recognised as a vital result for further research.

6.2 Implication of the study

The study is important from the academic and research perspectives.

Self-efficacy theory postulates the cyclical nature of self-efficacy, goals and attainment of goals. The present study has highlighted the reciprocity of influence among competence, general self-efficacy and self-esteem. It may lead to further research on the reciprocal influence of competence, general self-efficacy and career success as it is conceived that competence enhances both self-efficacy and career-success.

Self-esteem is a developable quality in teachers. Since it was found from this study that there is significant difference in self-esteem of teachers in government and private engineering colleges, focus has to be given to the enhancement of self-esteem in the case of engineering college teachers in the private sector. Educational institutions can frame appropriate training programmes that focus on the enhancement of self-esteem that influence general self-efficacy. If training is provided to the teachers of engineering colleges on self-esteem and general self-efficacy, their competence for effective performance may get strengthened.

Educational institutions can improve the existing system of selection of teachers by measuring self-esteem and general self-efficacy that influence competence to perform.

As the study showed significant difference in career counselling by teachers in the government and private engineering colleges, special emphasis has to be given to counselling as an important component that influence competence of teachers. Special training has to be given in academic counselling to teachers in the engineering colleges.

The study found that the teachers in the engineering colleges are contended with their present level of subject knowledge, self-esteem and general self-efficacy. They are also contended with their competence in performance. They are unable to project their career development.

In order to enhance the quality of engineering education, the teachers have to be challenged with new areas of teaching; development of market driven courses and novel learning styles; introduction of periodic class room teaching assessments; inclusion of teachers in research activities and provision to update their theoretical and practical knowledge.

The findings in this study may help the policy makers to apply the results while formulating recruitment and selection policies of teachers in engineering colleges across the country.

Also, training for teachers can be provided based on their level of competence, self-esteem and general self-efficacy which will increase their personal growth as well as self-worth of the teachers.

These results can be used for building a competence model in this domain of teacher competence.

6.3 Suggestions

Awareness programs on competence have to be generated among policy makers, educational program developers and teachers.

Tests to measure self-esteem, general self-efficacy and competence can be included in the process of selection and promotion of teachers.

Specific training can be given to teachers exhibiting low self-esteem and general self-efficacy to ensure quality teaching.

The knowledge and technical skills of the teachers can be enhanced by encouraging them to attend and conduct relevant conferences and seminars.

While recruiting new teachers, it is to be ensured that they are genuinely interested in considering teaching as their career. The pay package alone may not be considered as a deciding factor in selecting teachers in engineering colleges. It means that engineering institutions have to introduce more comprehensive recruitment process. To ascertain genuine interest in candidates, psychometric tests can be utilized. There are two main advantages for this selection process. One is that the engineering colleges can make sure of the person-job fit and the second is the reduction of attrition among teachers. Many times it is found that new recruits with no experience consider teaching as a temporary career option till a better one crops up.

The college authorities recruit fresh graduates and post graduates who may naturally extinct from teaching, once they get a better job with a better pay package. Moreover, it is difficult to appoint experienced teachers for low pay package as they are not ready to accept the offer. The lack of pension plan in private engineering colleges is also another relevant factor for the difficulty to attract excellent teachers. Therefore incorporate pension scheme in private engineering colleges similar that of the government engineering colleges.

Technology driven infrastructure may be implemented in phases to enhance the competence of teachers.

Online / digital resources for acquisition of latest information on subjects may be provided to teachers. Digital libraries in respect of each branch of engineering study may be established in engineering colleges.

Entrepreneurship laboratory, skill development laboratory and communication laboratory may be installed by ensuring leadership to teachers and they may be motivated by providing appropriate rewards. The interest to learn beyond the syllabus may be encouraged to develop entrepreneurial activities.

Innovations in teaching may be promoted in engineering colleges.

MOU with high performing technical educational institutions and industries inside and outside India may be promoted to foster institution-industry interactions for more effective knowledge application.

Engineering colleges may attract intellectually challenging teachers by enhancing the public image of the institution.

Teacher affiliation may be promoted in Associations of professional network to boost the self-esteem of teachers.

Resource person's bank may be formed to withdraw the human resource for technical and other kinds of training, evaluation and project guidance. This may also avoid incredible delay in publishing examination results. It may also be possible to use the human resource from the bank for promoting interactions with students along with class room teaching.

Teachers may be given opportunities to participate in decision making process regarding designing curriculum and update academic programmes.

Interest may be developed in teachers to participate in the development of skills and attitudes of students that help them seek for better jobs.

Teachers may be given responsibilities to invite qualified and trained academic and career practitioners.

Least performing teachers may be given opportunities for knowledge and skill development for a period of time and depending on their improvement appropriate decisions may be taken by the authorities on their retention.

Teachers may be recognised and rewarded based on their excellence in performance.

Teachers involved in activities promoting creativity among students may be specially acknowledged and rewarded.

There may be an ongoing performance evaluation system other than the self-rating system for teachers.

There may be provision to provide scholarship to join the doctoral programs in esteemed institutions.

Parent-teacher interactions may be promoted to enhance the environment of learning. It helps to provide better discipline in engineering colleges.

Engineering colleges may have to lay down plans for career development for teachers to motivate them in achieving their career goals.

Autonomy may be given to teachers in modifying the curriculum and introducing new teaching methods subject to sanction from authorities.

Involvement of teachers in social service activities along with students may strengthen the awareness about the social commitments of the educational institutions.

6.4 Conclusion

Teachers are the most vital intangible asset to promote quality education in our country. They are inevitable for the development of competent engineers to participate in the process of technological development of our country. Hence, the study on the role of self-esteem and general self-efficacy on competence of teachers in engineering colleges assumed significance.

Competence emerges as an important contributing factor to effective performance of teachers. Ensuring Competence in teachers in engineering colleges is the main challenge in the higher education sector as the out turn rate of engineering students as well as low hiring of students in reputable industries and other organisations display gross concern. In this study, teachers in engineering colleges are found to be contended about their subject knowledge, methodology of teaching, self-esteem and general self-efficacy. That itself is the main challenge to change. Instilling innovation and creativity in designing market driven

courses with new syllabi, developing creative teaching methodology and practices, ensuring technology driven infrastructure, providing institution-industry interactions and expanding campus selection opportunities by attracting participation of internationally renowned companies in hiring have to be the focal theme of the higher educational sector to assure educational excellence. Additionally, the study showed significant gap in the prevalence of academic counselling with special focus to career counselling in both government and private engineering colleges. Hence, attention may be given to fill this deficiency.

Teachers are our precious human resource. They are our social asset. Given opportunities for creative learning, and appropriate training in self-esteem and general self-efficacy, they can substantially contribute to quality engineering education.

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Appendix

Dear teachers,

I am Rama L., a full time research scholar working under the guidance of Dr. Sarada S. at School of Management Studies, CUSAT. As part of my Ph. D Research work, I have constructed tools to measure competences of teachers. For this purpose, I request your kind cooperation. I assure you that the data and information collected will not be disclosed to any source and hence will be used for research purpose only.

Thanking You

Yours truly

Rama L
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Section A

Personal Profile

Some of your personal information is required for research purpose. Kindly furnish the following information. It will be used only for research and will be kept confidential.

1. Name : _____

2. Designation: _____

3. Branch of engineering: _____

4. Age: _____ years

5. Gender: Male / Female

6. Marital Status:
   - ☐ Married
   - ☐ Unmarried
   - ☐ Separated/widow/ widower

7. Educational Qualifications:
   - ☐ Bachelors
   - ☐ Post Graduate
   - ☐ Doctorate
   - ☐ Post Doctoral Fellow

8. Experience: Total no of years :
   Number of years in industry if any :

9. In addition to the qualifications mentioned above have you done any special professional or technical training :

10. Number of projects :
11. Grant approved : ☐Yes ☐No
12. Number of technical books published :
13. Number of research articles :
14. International level :
15. National level :

16. If the total score is 100, how much do you apportion for the following function:
    a. Teaching: _____%
    b. Research: _____%
    c. Consultancy: _____%
    d. Extension services: _____%
17. In addition to your job are you a member of some professional board or association : ☐ Yes ☐ No
    If Yes please specify the board :_____

Section B

The following items describe the worthy feelings about yourself.

Sl No	Code	Item	Strongly agree 5	Agree 4	Disagree 2	Strongly disagree 1	Neutral 3
1	SE1	On the whole, I am satisfied with myself	5	4	2	1	3
2*	SE2	At times, I think I am no good at all	5	4	2	1	3
3	SE3	I feel that I have a number of good qualities	5	4	2	1	3
4	SE4	I am able to do things as well as most other people	5	4	2	1	3
5*	SE1	I feel I do not have much to be proud of	5	4	2	1	3
6*	SE2	I certainly feel useless at times	5	4	2	1	3
7	SE5	I feel that I'm a person of worth, at least on an equal plane with others	5	4	2	1	3
8*	SE6	I wish I could have more respect for myself	5	4	2	1	3
9*	SE3	All in all, I am inclined to feel that I am a failure	5	4	2	1	3
10	SE4	I take a positive to attitude toward myself	5	4	2	1	3

Section C

Instructions

The following items express competencies of you as a teacher while interacting with students and teachers on an average day at work. Please read carefully each statement and express your view with regard to each statement by **ticking your most** appropriate choice. There are five choices namely given **strongly agree (5), Agree (4), Neutral (3), Disagree (2), strongly disagree (1).** Please give your spontaneous responses for all items and give your responses as true as possible.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	SKS1	Present and show confidence in the subject area	5	4	2	1	3
2	SKS2	Prepare teaching and study guide for students	5	4	2	1	3
3	SKS3	Encourage and facilitate student learning of modern engineering concepts and practices	5	4	2	1	3
4	SKS4	Communicate effectively with students	5	4	2	1	3
5	SKS5	Attend to students vocational / career needs	5	4	2	1	3
6	SKS6	Prepare scheme of work and lesson plans	5	4	2	1	3
7	SKS7	Demonstrate and conduct laboratory and workshop work	5	4	2	1	3
8	SKS8	Identify and select appropriate teaching and learning resources/materials.	5	4	2	1	3
9	SKS9	Carry out industrial/field visits	5	4	2	1	3

Section D

In assessing and evaluating student's performance, this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	PER1	Formulate and develop the marking guide, ratings and grades	5	4	2	1	3
2	PER2	Evaluate students performance	5	4	2	1	3
3	PER3	Record and maintain a progressive record of students performance	5	4	2	1	3
4	PER4	Provide clear workshop and laboratory work instructions	5	4	2	1	3
5	PER5	Set, invigilate and mark examinations every semester	5	4	2	1	3
6	PER6	Compute the cumulative grade point average of the examination results	5	4	2	1	3

Section E

In reviewing and up-dating academic programmes and course content in line with guidelines this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	UPD1	Design plan, organise and implement programmes and courses	5	4	2	1	3
2	UPD2	Ensure that all resources, including space, lecturers and technology are used efficiently	5	4	2	1	3
3	UPD3	Innovative in terms of market-driven programmes to keep and attract students.	5	4	2	1	3
4	UPD4	Maintain quality and high standards of the programmes to keep and attract students	5	4	2	1	3
5	UPD5	Participation in decision- making and team work	5	4	2	1	3
6	UPD6	Initiate and manage change	5	4	2	1	3

Section F

In designing and implementing curriculum in line with guidelines and training objectives this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	ORG1	Determine, organise and implement the curriculum	5	4	2	1	3
2	ORG2	Create and maintain an environment and code of behaviour that promotes and secures good teaching, effective learning and high standards of achievement	5	4	2	1	3
3	ORG3	Manage and organise resources effectively and efficiently to meet the needs of the curriculum	5	4	2	1	3
4	ORG4	Set the objectives of the curriculum and courses	5	4	2	1	3
5	ORG5	Determine the teaching loads	5	4	2	1	3
6	ORG6	Develop assessment tools	5	4	2	1	3
7	ORG7	Communicate about curriculum to staff and students	5	4	2	1	3

Section G

In planning, organising and supervising engineering projects and students on industrial training in line with the departmental training objectives, this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	PRO1	Develop and supervise student's projects	5	4	2	1	3
2	PRO2	Test, mark and score the projects	5	4	2	1	3
3	PRO3	Identify, lobby and place students for industrial training	5	4	2	1	3
4	PRO4	Create and promote good public relations with industrialists/ employers	5	4	2	1	3
5	PRO5	Counsel and guide students	5	4	2	1	3
6	PRO6	Assess and evaluate projects and industrial training	5	4	2	1	3

Section H

In setting, administering and marking assignments, tests, practical and laboratory work every semester in line with rules and regulations, this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	PL1	Plan and analyse assignments and test items	5	4	2	1	3
2	PL2	Formulate and develop the marking guide and score the assignments, tests, and workshop and laboratory exercises	5	4	2	1	3
3	PL3	Prepare a scheme of work	5	4	2	1	3
4	PL4	Write standard test items	5	4	2	1	3
5	PL5	Prepare and provide clear instructions for assignments, tests, and workshop and laboratory exercises	5	4	2	1	3
6	PL6	Invigilate and mark examinations	5	4	2	1	3
7	PL7	Compute scores and grade candidates	5	4	2	1	3

Section I

In providing career guidance and counseling in academics and up-right morals in line with engineering professional practice and ethics, this is what engineering lecturers do.

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	CG1	Provide career guidance and counseling	5	4	2	1	3
2	CG2	Delegate the guidance and counseling responsibility	5	4	2	1	3
3	CG3	Avail space and time for guidance and counseling	5	4	2	1	3
4	CG4	Identify and provide all the relevant programmes offered by the departments	5	4	2	1	3
5	CG5	Counsel fellow lecturers who need assistance	5	4	2	1	3
6	CG6	Guide students on how to succeed in their career	5	4	2	1	3
7	CG7	Invite resourceful persons in the relevant professions to talk to students	5	4	2	1	3
8	CG8	Talk to students who exhibit peculiar behaviours	5	4	2	1	3
9	CG9	Generating knowledge by research is an integral part of a teacher	5	4	2	1	3
10	CG10	Application of available knowledge should be an integral part of teaching/consultancy	5	4	2	1	3
11	CG11	Popularising the subject/Extension of the subject by introducing new subjects	5	4	2	1	3

Section J

The following items describe the general self managing capabilities about yourself in life situations. Read each statement carefully and express your view by marking one of the five choices

Sl No	Code	Item	Always true 5	Frequently true 4	Infrequently true 2	Never true 1	Sometimes true 3
1	GSE1	I can always manage to solve difficult problems if i try hard enough	5	4	2	1	3
2	GSE2	If someone opposes me, i can find the means and ways to get what I want	5	4	2	1	3
3	GSE3	It is easy for me to stick to my aims and accomplish my goals	5	4	2	1	3
4	GSE4	I am confident that I could deal efficiently with unexpected events	5	4	2	1	3
5	GSE5	Thanks to my resourcefulness, i know how to handle unforeseen situations	5	4	2	1	3
6	GSE6	I can solve most problems if I invest the necessary effort	5	4	2	1	3
7	GSE7	I can remain calm when facing difficulties because I can rely on my coping abilities	5	4	2	1	3
8	GSE8	When I am confronted with a problem, I can usually find several solutions	5	4	2	1	3
9	GSE9	If I am in trouble, I can usually think of a solution	5	4	2	1	3
10	GSE10	I can usually handle whatever comes my way	5	4	2	1	3

18. How would you rate yourself as a teacher?

- ☐ 5-Excellent
- ☐ 4-above average
- ☐ 3-average
- ☐ 2-below average
- ☐ 1-poor

Thank You

List of Publications

[1] Published the research paper titled **"A study on competency Mapping of Managers"** in Perspectives on Emerging International Business Order in March 2014, page 150- 164

[2] Published the research paper titled **"**Role **of self-esteem and self-efficacy on competence - A conceptual framework"** in *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)* in February 2017, page 33-39

[3] Published a research paper titled **"A study on the effect of personal variables on factors of Competence of Engineering professors"** in International journal of core engineering & management in February 2017 page 14-26.