

CHAPTER 3

RESEARCH METHODOLOGY

The methodology describes the research design undertaken, instrument development and validation, details of population and sampling of the respondents, data collection method and tools used for analysis in the study.

The study is descriptive and exploratory in nature. The students' perception of their personality and self-efficacy is described and also the arts and science college students' level of transferable skills are explored. The period of data collection is between September 2014 and March 2015. The population for the study comprised the students pursuing the graduate, post graduate and professional courses and the sample of 1425 students are considered for the study. A total of 1274 responses are received from the students. 'Transferable Skills Scale' is developed to measure the transferable skills of the students. It is validated using the pilot study data where the items are purified for the final study. The pre-validated scale of personality and self-efficacy are also used after finding the reliability. The instrument is administered to 1425 students of various arts and science colleges and elicited 89.40% response rate. The data collected is analysed using percentage tool, mean and standard deviation, chi – square test, t – test ANOVA, correlation, regression, and discriminant analysis tool.

3.3 Research Design

The design that was adopted for the study is descriptive as well as causal in nature. Gupta and Gupta (2012) in their Business Research Methods book explain that, descriptive research is concerned with fact - finding study that is aimed at unfolding the characteristics of the variable under study in the present context. Causal research explores the effect of one variable on another. It is also called as explanatory research. It is necessary to observe the variation in the variable assumed to cause the change in the other variable and then measure the changes in the other variable.

Here the researcher is trying to find nature of personality and self-efficacy, through comparing and correlating the characteristics of an individual. The description is necessary as the job market is ready to absorb any individual with high transferable skills, a positive personality with high level of self-efficacy. Also the studies available on the same is found to be very less, that is transferable skills are little known.

3.4 Instrument development and Validation

This part of the chapter describes the validation of the model developed and the transferable skills scale developed by the researcher based on the literature reviewed. Different reviews from studies were referred to frame the measures of transferable skills (Farr, 1991; Sherer and Eadie, 1987; Liptak, 2008; Robinson, 2000; Friedman, 2010; Ojiako et al., 2011; Ryan, 2014; Boyatzis, 1982; Wang, 2006; Bolles; Lock, 2005; Liptak and Shatkin, 2011; Nabi and Bagley, 1999; Abdullah, 2009; Gefell, Director of American Counselling Association; Theodore, then Vice President – Finance, Ford Motor Company; National Association of Colleges and Employers (NACE); The Career Centre: University of Illinois at Champaign-Urbana; Missouri University Career Centre, (2010); National Network of Business and Industry Associations (2014), United States; Balcar *et al.*, (2011). The validated Big Five personality traits measuring scale (Buchanan *et al.*, 2005) and General Self-efficacy Scale (Schwarzer and Jerusalem, 1995) were adopted to measure them. The instruments were tested for validity and reliability through the pilot study, using SPSS analysis and PLS path modelling.

3.2.1 Contents of the Instrument

The instrument is intended to measure personal information, big five personality traits, transferable skills and general self-efficacy of the respondents who are higher education students. The instrument contains various parts as described below:

Personal Information

The first part of the questionnaire contains personal information about the demographics relevant to the students. It includes age, gender, qualification, department or discipline they pursue the course, institution they belong to, monthly family income, number of members in the family, previous work experience of the student, part time work experience of the student, type of education pursued in school, stay status of the student in the college as well as school.

Personality Scale to measure Big Five Personality

The second part of the questionnaire contains the personality scale. The big five personality scale was adapted by Taher *et al.*, (2011), which were based on a review of the

IPIP five factor personality inventory of Buchanan *et al.*,2005. The instrument consists of 20 items (table. 3.1), four for each of the five personality traits namely, conscientiousness, openness, extraversion, agreeableness and neuroticism. The items were phrased both positively and negatively.

Table: 3.1 Personality Scale Items developed by Buchanan *et al.*, (2005)

S.No	Personality Scale
1	My comment sometimes deeply hurt other students
2	I think that, when doing things, people can be trusted as having goodwill
3	I accept people as they are
4	It is easy for me to get back to people
5	I don't like drawing people's attention to myself
6	I make friends easily
7	I can easily attract my counterparts and hold their attention
8	I prefer keeping a low profile in my campus
9	I have frequent mood swings
10	Generally, I don't bother about people views and attitude towards me
11	I often panic, easily, about things around me
12	Generally, I am very pleased with my self
13	I carry out my plans to reach my goals
14	I often find myself unwilling to do my study work
15	I often pay attention to details
16	I often waste my time by doing unnecessary things
17	I am not interested in abstract ideas
18	I prefer voting for accepted leaders of students
19	I tend to support liberal students' leaders
20	I avoid logical/practical discussions in class

A rating of “1” on the positively phrased items or “5” on the negatively phrased items was indicative of very weak attributes while a rating of “5” on the positively phrased items or “1” on the negatively phrased items was indicative of very strong attributes. The instrument has used Likert scale rating where Completely Disagree scored as 1, Disagree scored as 2, Neither agree nor disagree scored as 3, Agree scored as 4 and Completely Agree scored as 5. The instrument was already used and has been validated by Taher and Chen, (2011) in their study. A very brief measure of the Big-Five personality domain used by Gosling *et al.*, (2003) has proved that short inventory big five personality scales can be used in order to elicit good response. Hence the same shorter version of big five scale of personality is adopted in the study.

Scale to measure Transferable Skills

The third part of the questionnaire describes the validation of the ‘Transferable Skills Scale’ which was developed to measure the transferable skills of students. The six soft skills most commonly mentioned are as follows: communication, interpersonal skills, leadership, organization, self-motivation and creativity (Razak *et al.*, 2013). In preparing 21st century students’ for a global society, Roekel, President, National Education Association, represented 4 C’s Critical thinking, Collaboration, Communication, And Creativity are part of effective skills. He specifies that teachers, colleges and/or universities have a huge role in ensuring that every student is adequately prepared. He adds that there has been a rapid increase in jobs involving non routine, analytic, and interactive communication skills.

Table: 3.2The constructs measuring various skills identified by Binks and Exley (1992)

S.No	Components of Transferable Skills	Item Categories
1	Personal skills	1. Initiative
		2. Independence
		3. Self-assessment
		4. Work in teams
		5. Leadership
		6. Seize Opportunities
		7. Time Management
		8. Effectiveness
		9. Planning
		10. Organising
		11. Establishing Priorities
		12. Flexibility
		13. Tenacity
		14. Stress Tolerance
2	Communication skills	1. Written
		2. Explaining
		3. Oral presentation
		4. Listening
3	Problem solving skills	1. Finding information
		2. Assessing information
		3. Decisiveness
		4. Numeracy
		5. Judgement

Source : *Nabi and Bagley (1999)*

Today’s job market requires competencies at a different scale. Hence the questionnaire intended to measure transferable skills of the students, was developed with the

inputs (Table 3.2) which were identified from the study of Nabi and Bagley (1999) on Graduates' perceptions of transferable personal skills and future career preparation in the UK as it included most of the skills required.

Item generation for Transferable Skills

The items for each of the transferable skill were developed based on previous literature review along with the guidance of the supervisor. The transferable skills can improve with application and practice, enable people to make contributions and add value, and allow people to describe their value to prospective employers (Lawson, 2000).

(d) Personal skills

A **personal skill** is the ability to do something. Personal skills and qualities are important to the employers; work based learning providers, colleges and universities. Friedman (2010) views that the personal skills set include skills that are related to artistic, communication, interpersonal, managerial, mathematical, mechanical, and scientific and are rated for each occupation.

Initiative is a skill that contributes to innovativeness. It is the power or opportunity to act or to take charge before others do. Innovative Skills includes the abilities to identify novel connections between disparate concepts and contexts that is identifying novel approaches to a process or task; combine disparate concepts, processes or tools in novel ways (Mueller, 2009). Outcomes of the study by Kalfa (2010) revealed that initiative is all about adapting to new situations, developing a strategic, creative, long term vision, being creative, identifying opportunities not obvious to others, translating ideas into action, generating a range of options and initiating innovative solutions. Such a skill is crucial for an individual.

Independence is another personal skill that employers expect from a candidate. Nabi and Bagley (1999) defined independence as “able to work without supervision”. When a candidate is appointed, he is immediately oriented about the job and organisation. It is done to ensure self-dependent operations on a long run.

Self-assessment is an important skill that assures an individual, he is aware of himself. Kalfa (2010) describes “self-assessment is about having a personal vision and goals, evaluating and monitoring own performance, having knowledge and confidence in own ideas and visions, articulating own ideas and visions, taking responsibility”. Mueller (2009) in his book ‘Assessing Critical Skills’ has stated that self-assessment is about including the abilities to apply relevant criteria to own work; identify strengths and weaknesses; judge when one

has successfully completed a task. Such a skill would enable a person to place himself in a job that he can perform effectively.

Organisations are concerned with productivity. Productivity is highly achieved through *team work*. Hence team work is considered to be a significant skill. Kalfa (2010) stated that team work contributes to productive working relationships and outcomes. According to Carran, Cohesiveness is a dynamic process which is reflected in the tendency for a group to stick together and remain in the pursuit of its goals and objectives (Buchanan, 1998). Smith (1989), expressed the skills to do with working in a group are: working in a team; ability to lead; ability to negotiate; resolving conflicting views; allocating group tasks; co-operating with others, and motivating others. Robles (2012) found that teamwork is about being cooperative, getting along with others, agreeable, supportive, helpful and collaborative. O'Neil (2000) termed sociableness which accounted for teamwork and it included such items as 'I try to be friendly to people', or 'I try to stick up for a friend when others are hurtful to him/her. Dyball *et al.*, (2007) paper proves that group-work to be a positive experience and a vehicle to develop transferable skills.

Leadership is defined as the ability to coordinate and supervise the activities of team members, assess team performance, assign tasks, plan and organize, and establish a positive atmosphere for team interaction (O'Neil *et al.*, 1997). Leadership is providing direction for the team (Kuehl, 2001). O'Neil (2000) supported leadership as control and included items such as, 'I try to have other people do things, I want to be done' or 'I take charge of things when I am with people'. These definitions and items explain the significance of leadership. Hence it is also identified as a critical personal skill.

Why one should *seize opportunities*? Opportunities are plentiful but available for a short period of time. Psychologists say that people who spot and seize opportunity are different. They are happier and more likely to achieve their goals (Webber, 2010). An individual's ability of seizing opportunities confirms the organisations that the person will have a vision and also arrange for the means to achieve it. This significant attribute contributes to the worth of the skill to an individual.

Time management skill is added as a personal skill because it allows an individual to accomplish more in a shorter period of time, which leads to career success. Time management skill includes the abilities to manage time for a task or situation. It recognizes the best strategies for certain kinds of tasks. It is considered to be a significant life skill and a critical skill needed in the workplace.

Personal effectiveness depends on one's innate characteristics such as determination, self-confidence and persistence. These qualities are the joys of the corporate workplace. Polziehn (2011) defined personal effectiveness is the ability to engage in meaningful reflection and how they fit in it have a keen sense of self-awareness of their personal and intellectual strength, re-assess their positions, values, and future plans in light of their life experience and critical self-analysis, to achieve an appropriate life-work balance and to deal effectively with challenging situations to achieve an appropriate life-work balance and to deal effectively with challenging situations and people, being flexible that will lead to self-sufficiency and satisfying personal and professional achievements, to understand the importance of time to handle several assignments with conflicting deadlines simultaneously and to regularly access and manage up-to-date information regarding career opportunities, the work environment, and professional development. Another critical personal skill, effectiveness is added to the inventory.

Planning and Organizing are the skills used in managing people in a group (Mayer Committee, 1992). Kalfa (2010), planning and organising skills contributes to long and short term strategic planning. Farmer and Campbell (1997) specified organizing is the ability in arranging work for ease of fitting into working day; staff management and training; budgeting/financial planning/costing; and time management skills. Transferable skills also include action planning and time management states Dyball *et al.*,(2007). These skills are necessary for an individual to be employable.

According to Harvard University Competency dictionary *establishing priorities* means identifying more critical and less critical activities and tasks in a process. As a skill it is the ability of evaluating a group of items and ranking them in their order of importance (Business Dictionary.com). Due to its relative importance it is added to the skill inventory.

Robles (2012) highlighted *flexibility* as adaptability, willing to change, lifelong learning, accepting new things, adjustable and able to teach. O'Neil *et al.*,(1997) define adaptability as the ability to monitor the source and nature of problems through an awareness of team activities and factors bearing on the task. Adaptability is the ability to detect and correct problems (Razak, 2012). Adaptability is the ability to recognize problems and respond accordingly (Kuehl, 2001). Flexibility is an essential skill necessary for face the rapidly changing world.

Tenacity is the state of being persistent. It is the ability to keep going, even when the going gets tough. Louis Pasteur says that his strength lies solely in his tenacity. Harvard University Competency Dictionary states tenacity as staying with a position or plan of action

until the desired objective is obtained or is no longer reasonably attainable. The focus is on the frequency of attempts to achieve a goal, as opposed to the quality of attempts. Effectiveness in tenacity requires individuals to balance frequency of attempts with knowing when to quit. Tenacity is a quantitative skill which is highly required in today's turbulent world.

Stress tolerance is another required skill to manage the fast changing world. It is defined as an ability to deal with pressure (Kalfa, 2010). This competency focuses on maintaining stable performance under pressure and relieving stress in an acceptable manner. Stress can be a constant in a job. A person might be able to maintain performance under pressure (Harvard University Competency Dictionary).

Thus the personal skill items were understood through the available literature. Further the item categories were developed by the researcher are summarised as mentioned below:

1. Initiative (Kalfa, 2010)
 - a. I work without being prompted by others
 - b. I wish to create something new
 - c. I want to build my own business
2. Independence (Nabi and Bagley, 1998)
 - a. I am capable of thinking or acting for myself
 - b. I would like to pursue my own life style
 - c. I do not want to be constrained by the rules of an organization
3. Self-Assessment (Mueller, 2009 and Kalfa, 2010)
 - a. I am able to determine what improvements are required in me
 - b. I am aware of my strengths and weaknesses
 - c. I will be able to use different types of talents in me
4. Work in Teams [Smith (1989), Robles (2012), O'Neil (2000) and Dyball et.al (2007)]
 - a. It is easy for me to work cooperatively in the group
 - b. I can socialize with people
 - c. I very friendly and congenial
5. Leadership (O'Neil *et al.*, 1997 and Kuehl, 2001)
 - a. I can inspire others to perform and engage in achieving goals
 - b. I will be able to influence others
 - c. I will be able to bring harmony among people of conflicting interest
6. Seize Opportunities (Webber, 2010)

- a. I always expose myself to set of circumstances with uncertain outcomes
 - b. I often find, what I want to do
 - c. I can create possible outcomes for the future
7. Time Management
- a. I allocate systematic time for my work
 - b. I feel like time runs ahead of my schedule
 - c. I can cut time wastage wherever necessary
8. Effectiveness (Polziehn, 2011)
- a. I always achieve my objectives or targets
 - b. I am often appreciated for being doing my work
 - c. I had progress as set by the standards
9. Planning (Farmer and Campbell, 1997 and Dyball *et al.*,2007)
- a. I plan my work
 - b. I have targets for next year
 - c. I feel capable of my future commitments
10. Organising (Farmer and Campbell, 1997 and Dyball *et al.*,2007)
- a. I can arrange required resources for the work in hand
 - b. I can solicit and use others inputs
 - c. I have the resources that are needed to do my work
11. Establishing Priorities (Harvard University Competency Dictionary)
- a. It is easy for me to prioritize my workload
 - b. I am concerned about the tasks with me
 - c. I am always ahead of my schedule
12. Flexibility [Robles (2012), O'Neil *et al.*,(1997), Kuehl, (2001)]
- a. I feel adaptability to change is significant
 - b. I am able to balance my personal and family requirements
 - c. I am comfortable with sudden changes in my assignments
13. Tenacity (Harvard University Competency Dictionary)
- a. I am strong in my decisions
 - b. I am decided and have comfortable choice
 - c. I feel enthusiastic to take decisions
14. Stress Tolerance (Kalfa, 2010)
- a. I can handle stressful situations

- b. I am not frustrated by anything
- c. I am emotionally balanced

(e) Communication Skills

Communication is defined as the clear and accurate exchange of information between two or more team members and by the ability to clarify or acknowledge the receipt of information (O'Neil *et al.*, 1997). Effective communication is the overall exchange of concise and accurate information (Kuehl, 2001). Effective communication is likely the most important measure of team performance (Razak, 2013). Communication is a social sense of being human. It raises and establishes the connection to others. These are skills persuasively or creatively or to simply convey a message/information. Communication skills include oral, speaking capability, written, presenting and listening (Robles, 2012). Information can be sent through speech, writing, or signs. Mayer Committee (1992), states that writing skills uses technology. Thus communication contributes to productive and harmonious relations of people and thus its role is highly significant in the work place.

Writing skills is vital as it is a special ability to produce well expressed and easily understandable text. The productive writing skill is considered as a cognitive challenge, because it helps to assess language competency, recalling capability and thinking ability. It demands to recall information from long-term memory (Kellogg *et al.*, 2007).

Explaining skill can be rephrased as reasoning. Reasoning includes explaining opinions, actions and decisions, and using deduction (Higgins *et al.*, 2007). These skills help a person to protect himself from any difficult situation. Hence it is identified as a key skill.

The ability to communicate orally supports sound psychological development (Morreale *et al.*, 2000). Skill in *oral presentations* can be enhanced by giving chance to rehearse before a small group and by training in the preparation.

Listening has been labelled as a vital comprehension skill, i.e. the ability to listen to and understand users' needs and requests (Farmer and Campbell, 1997). Listening is said to be a key management skill (Flynn *et al.*, 2008). In the work place, "ability to listen well is a basic strength of good employees and employers" (Benoit and Lee, 1988). Cooper (1997), in Flynn et al (2008), "present listening as a complex, multidimensional behavioural skill. Listening involves hearing and cognition and assumes the ability to selectively perceive, interpret, understand, assign meaning, react, remember, and analyse what is heard"

Basic communication skills as identified in the questionnaire of Ameen (2013) included reading with understanding, writing, synthesizing ideas, ability to write simple English correctly using proper words, write official letter, memo, report and job application, speaking with clarity using appropriate voice tone, using body language appropriately, listening attentively, presentation skills, and interviewing skills. Based on the literature reviewed the item categories are derived about communication skills were summed up below:

1. Written Skills (Kellogg *et al.*, 2007).
 - a. I can write reports/manuals by using all forms of technology
 - b. I am unambiguous in the report preparations
 - c. I am good at verbal skills
2. Explaining (Higgins *et al.*, 2007)
 - a. I always present ideas effectively in speeches or reports
 - b. I can give constructive feedbacks
 - c. I am able to justify the work I have done
3. Oral Presentation (Morreale *et al.*, 2000).
 - a. I speak well in public
 - b. I can inspire people to listen my words
 - c. I able to influence people about my ideas
4. Listening [Farmer and Campbell, (1997) Flynn *et al.*, (2008) and Benoit and Lee, (1988)]
 - a. I am good at listening to the questions and understand what is essential
 - b. I listen attentively
 - c. I able to understand others gestures

(f) Problem Solving Skills

The National Research Council (NRC) states that **problem solving** is “the ability to apply knowledge to novel situations, that is, transfer of learning, is affected by the degree to which students learn with understanding” (McDonald, 2010). Smith (1989) researched on skills that are related to problem solving. He explains that they are the ability to learn quickly; specifying personal objectives; critical thinking; prioritising issues; showing creativity and imagination in thinking; evaluating alternatives; putting ideas into practice; organising own work, and understanding numerical information quickly and accurately. Mueller (2009) has termed problem solving skills as meta-cognitive skills. These skills are those skills including the abilities to monitor one’s progress on a task; assess task difficulty;

anticipate likelihood of difficulty on a task; acknowledge one's strengths and limitations; evaluate effectiveness of current and alternative strategies; recognize when a change in approach is needed and make adjustments; identify errors; take control of learning.

Information abilities proposed by the Mayer Committee (1992) were: (1) collecting, analysing and organising ideas and information (2) expressing ideas and information. Informational skills are used to organize and process information and coordinate activities. *Information search* is a critical ability to be possessed by any individual since it helps in handling situations in an effective manner.

Assessing information labelled as analytical skills are skills used in discovering, collecting, and analyzing information (Liptak and Shatkin, 2011). The vigilant assessment of information is identified as a crucial skill and added in the problem solving construct.

Decisiveness is about decision making and it is the ability to make team decisions by utilizing available information (Kuehl, 2001). O'Neil *et al.*, (1997) defined decision making as the "ability to integrate information, use logical and sound judgments, identify possible alternatives, select the best solution, and evaluate the consequences". This essential skill makes sure that an individual decides anything systematically.

Numeracy is using mathematical ideas and techniques (Mayer Committee, 1992). Liptak and Shatkin (2011) stated numerical skills are used in calculating, examining, and interpreting data and financial records. Numerical ability is about using mathematics including budgeting and financial management to solve problems (Kalfa, 2010). Greenberg (2010) explained numerical ability is the ability to perform basic mathematical operations quickly and accurately. Numerical reasoning is the ability to analyse logical relationships and to recognize the underlying principles underlying them. Such numerical calculations require high level of ability to avoid riskier aspects of the organisations.

Judgement is found as a significant skill as it facilitates agreement. It seeks a win-win solution through a give-and-take process that recognizes each party's core needs (Harvard University Competency Dictionary). In organisational set up, everybody needs to know the knack of judging things or others.

Reeff *et al.*, (2006) assessed problem solving competencies and developed a draft version of a general framework. They explain that cognitive processes are activated in the course of problem solving are diverse and complex. Among the processes, the components identified were searching for information, and structuring and integrating it into a mental

representation of the problem, reasoning, planning actions and other solution steps, executing and evaluating solution steps and continuous processing of external information and feedback.

Thus problem solving skills measuring finding information, assessing information, decisiveness, numeracy and judgement were quantified with the help of literature review and elucidated below:

1. Finding Information (Mayer Committee, 1992)
 - a. I approach appropriate information sources
 - b. I am information search savvy
 - c. I often use formation technology to collect information for my assignments
2. Assessing Information (Liptak and Shatkin, 2011).
 - a. I can formulate insightful and relevant questions and test for its results
 - b. I will evaluate each piece of information before decision making.
 - c. I always follow standard procedures
3. Decisiveness (Kuehl, 2001)
 - a. I am able to create innovative solutions to complex problems
 - b. I work on problems that are insoluble
 - c. I make clear estimation of choices
4. Numeracy (Liptak and Shatkin, 2011 and Greenberg, 2010)
 - a. I am good at calculating mathematical computations
 - b. I am not number allergic
 - c. I have clear calculations and record of my financial commitments
5. Judgement (Harvard University Competency Dictionary)
 - a. I take rational decisions
 - b. I am always unbiased
 - c. I face things from others perspective.

The instrument has used Likert Scale rating where ‘strongly disagree’ is scored as 1, ‘disagree a little’ is scored as 2, ‘neither agree nor disagree’ is scored as 3, ‘agree a little’ is scored as 4 and ‘strongly agree’ is scored as 5. All the item categories were positively phrased.

Scale to measure general Self-efficacy

The last part of the questionnaire contains the general self-efficacy scale. The self-efficacy scale developed by Schwarzer and Jerusalem (1995) measuring one’s self-reliance, self-determination and persistence was used in the study. The instrument was already

validated in Indian context by Verma and Sharma (2013) in their study on Construct Validation of Self-Efficacy Scale. The same instrument shown in the table 3.3 was used in the study.

Table: 3.3 The General Self-efficacy Scale developed by Schwarzer and Jerusalem (1995)

S.No	General Self-efficacy Scale
1	I can always manage to solve difficult problems if I try hard enough.
2	If someone opposes me, I can find the means and ways to get what I want.
3	I can solve most problems if I invest the necessary effort.
4	It is easy for me to stick to my aims and accomplish my goals.
5	I am confident that I could deal efficiently with unexpected events.
6	Thanks to my resourcefulness, I know how to handle unforeseen situations.
7	I can remain calm when facing difficulties because I can rely on my coping abilities.
8	When I am confronted with a problem, I can usually find several solutions.
9	If I am in trouble, I can usually think of a solution.
10	I can usually handle whatever comes my way.

The instrument has used Likert Scale rating where ‘not at all true’ scored as 1, ‘hardly true’ scored as 2, ‘moderately true’ scored as 3, ‘often true’ scored as 4 and ‘exactly true’ scored as 5. All the item categories were positively phrased. The self-efficacy scale contains 10 statements describing the individual’s belief that he or she is capable of performing a given task. A person with high self-efficacy believes in taking more risks and accepts challenging tasks, whereas people with low self-efficacy tend to avoid difficult tasks and accept easy ones to perform according to their efficacy beliefs (Verma and Sharma, 2013).

3.2.2 Content Validity

The measurement items contained in an instrument should cover the major content of a construct (Churchill, 1979). Content validity is the degree to which the instrument items represent the universe of the concept under study. It is usually achieved through a comprehensive literature review and interviews with practitioners and academicians. It is the representative or sampling adequacy of the content of the measurement instrument.

The three items measuring transferable skills viz., personal skills, communication skills and problem solving skills are developed with 69 items. The items are reviewed and evaluated by the research supervisor and a few academicians. The objective is to audit the

clarity of words and preciseness of the phrases and relevancy of measurement. The experts helped in modifying the items by removing the ambiguous phrases and suggested apt phrases. Addition, deletion and rephrasing are done wherever necessary. Finally an instrument with 59 item categories is approved and it has been used in the pilot study.

The following changes in the personal skill category are incorporated. The item under **initiative**, 'I want to build my own business' is reframed as 'I come forward and take up responsibilities' as these words are more apt to the respondents because they are students. In the next item **independence**, the phrase 'I do not want to be constrained by the rules of an organisation' is modified as 'I don't look forward for assistance or help in my activities' as the student may get confused about the word organisation.

The item under **self-assessment**, 'I will be able to use different types of talents in me' is found as not necessary and hence removed. Even though the words '**friendly**' and '**congeniality**' are giving the similar meanings, it is decided to give it separately as the precision of the measuring item should be repeatable under the unchanged condition. Also sometimes the words can be synonymous in colloquial use but may be contrasted in certain conditions. Hence these words are separated in two different sentences under the item category, **work in teams**. Because of the complexity of the phrases such as 'I always expose myself to set of circumstances with uncertain outcomes', 'I often find, what I want to do' and 'I can create possible outcomes for the future' under the category **seize opportunities**, they are totally modified into 'I am alert to information related to my interests' and 'I grab opportunities to excel'. The item 'I can cut waste of time wherever necessary' is found as not adding any additional information under the category **time management**, it is removed.

The item under **effectiveness**, 'I had progressed as set by the standards' is simplified into 'I had progressed as I had planned'. As the phrase 'I feel capable of my future commitments' is not apt to the young students at large, it is removed. As the item, 'I have the resources that are needed to do my work' would not solicit any additional information, under the category **organising**, it is removed. The items under **establishing priorities** such as 'I am concerned about the tasks with me' and 'I am always ahead of my schedule' are been rephrased as 'While doing tasks, I seldom check if I am doing the most important job' and 'I pursue tasks of importance rather than in order' as it would measure the priority aspect in a better manner.

Under the item **flexibility**, 'I feel adaptability to change is significant' is simply reworded as 'I am adaptable to change'. Also in the item 'I am comfortable with the sudden changes in my assignments' the word 'assignment' alone is replaced with 'routine'. The item,

'I am decided and have comfortable choice' is negatively rephrased as 'I get easily upset when things get uncertain' in order to seek better opinion on the **tenacity** category of personal skills.

The personal skills measuring items under the categories viz., leadership and stress tolerance remain unchanged.

The categories measuring the communication skills of the student are also modified slightly. 'I am unambiguous in the report preparation' is removed as the other two items are found enough to understand **written skills** category. The items under **explaining** category remains unchanged. The **oral presentation** category item 'I can inspire people to listen my words' is simplified as 'I can inspire people to listen to me' and the item 'I able to influence people about my ideas' is removed as it replicated the other two items. The item 'I am good at listening to the questions and understand what is essential' is simplified as 'I am a good listener' and the item 'I listen attentively' is removed under the category **listening**.

The first item under **finding information** category, 'I approach appropriate information sources' is simply rephrased as 'I am able to identify appropriate information sources'. The other two items are retained as such. **Assessing information** had three items. Since the students did not find relevance of such thought, the first item, 'I can formulate insightful and relevant questions and test for its results' is ignored. The second item 'I will evaluate each piece of information before decision making' is simplified as 'I evaluate the information before making decision'. The third item is kept unchanged. The next category **decisiveness** which had three items are totally modified and finally had two items such as 'I evaluate the information before making decision' and 'I always follow standard procedure'. The items under **numeracy** are simplified as 'I am comfortable with numbers' instead of 'I am good at calculating mathematical computations' and 'I am not number allergic'. And a new phrase; 'Having quantified information help me to solve issues rather than just qualitative information' to measure numerical ability is added. The final item category **judgement** remains unchanged.

3.2.3 Pilot study

The instrument is administered among 89 students across different disciplines from a reputed institution for the pilot study. The empirical data is analysed using SPSS to ensure the reliability and validity of the instrument.

3.2.4 Reliability Analysis

Reliability in research methods is concerned about the quality of measurement. In general, Reliability is the degree to which a set of latent indicators are consistent in their measurements. The reliability (internal consistency) of the items comprising each dimension is examined using Cronbach alpha. A commonly used threshold value for acceptable reliability is 0.70, although this is not an absolute standard, and values below 0.70 have been deemed acceptable if the research is exploratory in nature (Hair *et al.*, 2003; Boudreau Gefen and Straub, 2000).

Personality scale - The results of the reliability statistics of the personality scale developed by Buchanan *et al.*, (2005) showed Cronbach's alpha as 0.695 for all the 20 items, which indicates a high level of internal consistency for the total item scales with these specific samples. Hence the same items are used the study.

Transferable skills - As the transferable skills inventory is developed by the researcher, purification is carried out by examining corrected-item total correlation (CITC) score of each item with respect to a specific dimension of a construct. An item-total correlation test is performed to check if any item in the set of tests is inconsistent with the averaged behaviour of the others, and thus can be discarded. The analysis is performed to purify the measure by eliminating 'garbage' items prior to determining the factors that represent the construct; (Churchill, 1979). The CITC score is a good indicator of how well each item contributes to the internal consistency of a particular construct as measured by the Cronbach's alpha coefficient (Cronbach, 1951). An overall measure for an individual would be considered as the average of the scores for a number of different tests. A check on whether a given test behaves similarly to the others is done by evaluating the Person's Correlation (across all individuals) between the scores for that test and the average of the scores of the remaining tests that are still candidates for inclusion in the measure. In a reliable measure, all items should correlate well with the average of the others. A small item-correlation provides evidence that the item is not measuring the same construct measured by the other items included. A correlation value less than 0.2 or 0.3 indicates that the corresponding item does not correlate very well with the scale overall and, thus, it may be dropped (Everitt, 2002, Field, 2005). Items are deleted if their CITC scores are below 0.3 unless there are clear reasons for keeping the item despite of low item total item correlation.

On the other hand, certain items with CITC scores above 0.3 may also be removed if their deletion can dramatically improve the overall reliability of the specific dimension.

Table : 3.4 Item description, CITC and Alpha Value

S.No	Transferable Skills item categories	CITC I	CITC II
Personal Skills			
	1. Initiative		
1	I work without being prompted by others	.371	.371
2	I wish to create something new	.545	.545
3	I come forward and take up responsibilities	.343	.343
Alpha value of initiative		.599	.599
	2. Independence		
4	I am capable of thinking or acting for myself	.496	.507
5	I would like to pursue my own life style	.520	.507
6	I don't look forward for assistance or help in my activities	.337	Deleted
Alpha value of independence		.637	.673
	3. Self-Assessment		
7	I am able to determine what improvements are required in me	.271	.271
8	I am aware of my strengths and weaknesses	.271	.271
Alpha value of self-assessment		.425	.425
	4. Work in Teams		
9	It is easy for me to work cooperatively in the group	.495	.495
10	I can socialize easily with people	.485	.485
11	I am very friendly	.601	.601
12	I am congenial	.482	.482
Alpha value of work in teams		.726	.726

	5. Leadership		
13	I can inspire others to perform and engage in achieving goals	.393	.393
14	I will be able to influence others	.477	.477
15	I take interest in the welfare of my subordinates	.406	.406
	Alpha value of leadership	.616	.616
	6. Seize opportunities		
16	I am alert to information related to my interests	.533	.533
17	I grab opportunities to excel	.533	.533
	Alpha value of seize opportunities	.694	.694
	7. Time Management		
18	I allocate systematic time for my work	.567	.567
19	I feel like time runs ahead of my schedule	.567	.567
	Alpha value of time management	.720	.720
	8. Effectiveness		
20	I always achieve my objectives or targets	.392	Deleted
21	I am often appreciated for doing my work	.628	.595
22	I had progressed as I had planned	.520	.595
	Alpha value of effectiveness	.693	.746
	9. Planning		
23	I plan my work	.462	.462
24	I have targets for next year	.462	.462
	Alpha value of planning	.631	.631
	10. Organizing		
25	I can arrange required resources for a work in hand	.344	.344
26	I can solicit and use others inputs	.344	.344
	Alpha value of organizing	.502	.502
	11. Establishing Priorities		
27	It is easy for me to prioritize my workload	.513	.513
28	While doing tasks, I seldom check if I am doing the most important job	.627	.627
29	I pursue tasks of importance rather than in order	.639	.639

Alpha value of establishing priorities		.760	.760
12. Flexibility			
30	I am adaptable to change	.462	Deleted
31	I am able to balance my personal and family requirements	.647	.596
32	I am comfortable with sudden changes in my routine	.553	.596
Alpha value of flexibility		.729	.746
13. Tenacity			
33	I am strong in my decisions	.515	.572
34	I get easily upset when things get uncertain	.623	.572
35	I feel enthusiastic to take decisions	.419	Deleted
Alpha value of tenacity		.699	.727
14. Stress Tolerance			
36	I can handle stressful situations	.473	.473
37	I am not frustrated by anything	.619	.619
38	I am emotionally balanced	.473	.473
Alpha value of stress tolerance		.702	.702
Communication Skills			
15. Written Skills			
39	I can write reports/manuals by using all forms of technology	.422	.422
40	I am good at verbal skills	.422	.422
Alpha value of written skills		.590	.590
16. Explaining Skills			
41	I always present ideas effectively in speeches or reports	.536	.536
42	I can give constructive feedbacks	.695	.695
43	I am able to justify the work I have done	.585	.585
Alpha value of explaining skills		.768	.768
17. Oral Presentation			
44	I speak well in public	.421	.421
45	I can inspire people to listen to me	.421	.421
Alpha value of oral presentation		.592	.592

	18. Listening		
46	I am a good listener	.268	.268
47	I able to understand others gestures	.268	.268
	Alpha value of listening	.423	.423
Problem Solving Skills			
	19. Finding Information		
48	I am able to identify appropriate information sources	.478	.552
49	I am information search savvy	.525	.552
50	I use technology to collect information for my assignment	.321	Deleted
	Alpha value of finding information	.621	.710
	20. Assessing Information		
51	I evaluate of information before making decision	.363	.363
52	I always follow standard procedure	.363	.363
	Alpha value of assessing information	.531	.531
	21. Decisiveness		
53	I am able to generate solutions to complex problems	.336	.336
54	I will be able to generate alternatives to issues that I face	.336	.336
	Alpha value of decisiveness	.502	.502
	22. Numeracy		
55	I am comfortable with numbers	.348	.348
56	Having quantified information help me to solve issues rather than just qualitative information	.348	.348
	Alpha value of numeracy	.516	.516
	23. Judgement		
57	I take rational decisions	.414	Deleted
58	I am unbiased	.709	.616
59	I see things from others perspective.	.506	.616
	Alpha value of judgement	.716	.762

The various items stated for each characteristic, their respective corrected item total correlation for two iterations and the alpha value for each personal skill, communication skill and problem solving skill is given in the table. 3.4

The three items of initiative, measuring personal skill has CITC scores above 0.3 and the alpha value is 0.599. Even though the alpha is lesser than 0.7, the item categories are retained because the skill is found relevant and important.

Independence item under personal skills had three categories viz., capability of thinking, life style and seeking assistance. The item-total statistics revealed removal of the third item (seeking assistance) would largely increase the alpha value from 0.637. It is assumed that independence is measured within capability of thinking and life-style; it is decided to discard the item about seeking assistance. The removal of the third item resulted increase of cronbach alpha to 0.673.

Self – Assessment is a critical skill as referred by Mueller (2009), the item categories measuring strength and weakness, improvements required in one self are so significant, the item categories are retained though the CITC scores are less than 0.3 and cronbach alpha value less than 0.7.

The item-total statistics of work in teams item categories revealed the CITC scores above 0.3 and cronbach alpha value greater than 0.7. Higher reliability scores determined retainment of all the item categories in the work in team item.

Leadership item categories concerning inspiring others, influencing others and interest in welfare of subordinates, CITC scores are above 0.3 and the alpha value is closer to 0.7, the item categories are retained.

The CITC scores and alpha value are 0.533 and 0.694 for the item categories of seize opportunities. As the scores are above 0.3 and closer to 0.7 respectively, the items are retained.

Time management skills are measured through two item categories viz., systematic allocation of time and management of schedule. The CITC scores are .567 respectively. The alpha value is .720. Since both the scores are above the accepted values, them categories are used as such.

All the items measuring effectiveness had good CITC score. But the achieving targets and progressed as per plans measured the same thought and also deletion of achieving targets would rise the alpha value to a great extent, the same is discarded. The alpha value of effectiveness increased from .693 to .746.

With respect to planning, two item categories viz., planning work and next year targets are measured. The item categories CITC score are .462 respectively. And also the alpha value is closer to .7 i.e. .631, hence the categories are included.

The item categories of organizing skills are mainly about arrangement of resources and about soliciting inputs. Each scored .344 CITC values. As the research considers values above .3 the item categories are accepted. Also the alpha value (.502) is accepted though it is lower than .7 because organising is a crucial skill necessary for every student.

Establishing priorities had three categories such as prioritising workload, check on important job and pursuance of tasks. All the categories CITC score is above .3 and the alpha value is .760. Hence they are included in the study.

Adaptability of student considered as very significant skill. Such a skill is measured through three item categories. The results of item total statistic revealed that they are of good fit. The alpha value had the possibilities of increasing from .729 to .746, if the item category adaptable to change is removed because it is also measured in the category comfort with sudden changes. Hence the item is discarded and allowed for the increase in alpha value.

Tenacity is measured through three categories such as strength of decisions, state of mind during uncertainty and enthusiasm in taking decisions. The item category enthusiasm in taking decisions is vague and also its deletion had the possibility of increasing the final alpha value to .727, the item category is discarded. And the item 'I get easily upset when things get uncertain' is negatively phrased, it is determined to reverse score it during the data analysis.

There are three item categories to check tolerance of stress among students. The categories had good CITC scores as well as alpha value. Hence all the items are included for the study.

The Communication skills item categories CITC scores are between .268 and .695. The alpha values are also between .423 and .768. Though the scores and values are of the items such as writing skills, explaining skills, oral presentation and listening skills are very significant (David Smith, 1989) to measure communication skills, all the item categories are retained as such.

Finding information, the item of problem solving skill is given by three item categories. Each item scored CITC values more than .3. The third item category about use of

technology for assignment completion is vague, it is decided to be removed and also removal of the particular item category increased the alpha value to .710.

Assessment of information, decisiveness and numeracy are the part of problem solving skills. Each item had two categories and each of its CITC score are .363, .336 and .348 respectively. The alpha values are below .7 but above .5. Since it is believed that these item categories are very much significant to measure problem solving ability, all are taken up for further study.

Rationality in making decisions, un-biasedness and viewing things others perspective are the item categories of judging skill. These categories are well scored above .3. But rationality in making decision is too vague for a student to respond. Hence the item category is eliminated from the judgement item. Finally the alpha value is .762.

The overall reliability of the transferable skills after item category deletions is found to be .935 (Table: 3.5). The alpha scores of the items and the instrument is found convincing and hence is reliable. The final instrument had 53 Transferable Skills Scale.

Table: 3.5. Reliability analysis – Value of Cronbach Alpha

Overall Reliability of the Transferable Skills Scale is 0.935.	
Transferable Skills Items	Reliability (Cronbach Alpha)
Personal skills	.914
Communication skills	.782
Problem Solving Skills	.696

The General Self-efficacy Scale - The results of the reliability statistics of the general self-efficacy scale developed by Schwarzer and Jerusalem (1995) achieved Cronbach's alpha as 0.729 for all the 10 items, which indicates a high level of internal consistency for the total item scales with these pilot study samples.

3.2.5 Construct Validity

Construct validity is the degree to which scores on a test can be accounted for by the explanatory constructs of a sound theory (Kothari and Garg, 2013). Construct validity is generally ensured using convergent validity, discriminant validity and confirmatory factor analysis.

Convergent validity refers to the degree to which two measures of constructs that theoretically should be related in fact related. The Average Variance Extracted (AVE) measures the percentage of variance captured by a construct by showing the ratio of the sum of the variance captured by the construct and measurement variance (Boudreau, Gefen and Straub, 2000). As the instrument measures qualitative constructs developed by the researcher and also previously validated instrument constructs, the average variance extracted were satisfactory. The following table 3.6 reveals the validity of convergence.

Table 3.6 Composite Reliability and Average Variance Extracted (AVE)

Construct	Composite Reliability	Average Variance Extracted
Big five personality	0.655	0.467
Personal Skills	0.924	0.368
Communication Skills	0.847	0.482
Problem Solving Skills	0.798	0.415
Self-efficacy	0.782	0.398

Discriminant validity or divergent validity measures whether the constructs that should not to be related or in fact not related. Accurately the constructs should measure only those factors for which it is framed. The constructs of the study are analysed for discrimination by calculating the average root mean square variance between the constructs. This has to be greater than the correlation between the constructs. Table 3.7 shows that all the constructs considered expressed discriminant validity.

Table 3.7 Discriminant Validity between Constructs

Construct	RMS Variance	Correlation
Personality and Personal Skills	0.417	0.335
Personality and Communication Skills	0.474	0.264
Personality and Problem Solving Skills	0.441	0.250
Personality and Self-efficacy	0.383	0.239
Personal Skills and Self-efficacy	0.440	0.316
Communication Skills and Self-efficacy	0.406	0.256
Problem Solving Skills and Self-efficacy	0.432	0.415

In statistics, confirmatory factor analysis (CFA) is a form of factor analysis. It is used to test whether measures of a construct are consistent with a researcher's understanding of the nature of that construct (or factor). The factor loadings and cross loadings are found to check whether the items have highly loaded on the respective constructs. This would ensure construct validity. The factor loadings are shown in the table 3.8. Testing the CFA helps in examining construct validity.

All the items under Transferable Personal Skills (TPS), Transferable Communication Skills (TCS) and Transferable Problem Solving Skills (TPSS) are loaded on their respective factors. The factor loadings and cross loadings ensure confirmatory factor analysis and hence construct validity of the different constructs are understood.

Table 3.8 Factor Structure Matrix of Loadings and Cross-Loadings

Items	A	E	N	C	O	PS	CS	PSS	SE
Agree	0.4776	0.0147	0.2418	0.0406	-0.0153	-0.2191	-0.2246	-0.3717	-0.2919
Agree	0.7009	0.2762	-0.3318	0.2399	0.2830	0.4376	0.3133	0.3770	0.3473
Agree	0.7580	0.2633	-0.3489	0.3699	0.4426	0.4726	0.4003	0.3859	0.3061
Agree	0.5097	0.1392	-0.1524	0.1814	0.1278	0.3229	0.1946	0.2066	0.1729
Extro	0.0184	0.0841	-0.0134	-0.0589	-0.1176	0.0848	0.0834	0.0726	0.0171
Extro	0.2255	0.8573	-0.2633	0.2168	0.3943	0.4161	0.3500	0.3245	0.3535
Extro	0.3090	0.8690	-0.1926	0.3462	0.3875	0.4040	0.4146	0.2869	0.3078
Extro	-0.0825	0.1535	0.1379	-0.0181	0.1431	0.1215	0.1168	0.0118	-0.0721
Neuro	0.2831	-0.0474	0.4558	0.1278	0.2710	0.1312	0.1804	0.3096	0.2376
Neuro	-0.2102	-0.1562	0.7515	-0.1702	0.2155	-0.3223	0.3023	0.3493	-0.3430
Neuro	-0.0347	0.0205	0.1294	0.0998	0.0667	0.0369	0.0993	0.0233	-0.0095
Neuro	0.3539	0.2693	0.6305	0.2881	0.1985	0.4105	0.2365	0.3131	0.3134
Cons	0.3031	0.3064	-0.2677	0.8919	0.3104	0.4784	0.5133	0.4434	0.3860
Cons	-0.0276	-0.0435	0.1688	0.4563	0.0641	-0.0938	0.1603	0.0876	-0.0449
Cons	0.2093	0.1472	-0.2147	0.5515	0.1553	0.1918	0.2586	0.1917	0.0915
Cons	-0.1775	-0.0590	0.1861	0.1414	0.0020	-0.0431	0.0027	0.1122	-0.0991
Open	-0.3515	-0.1714	0.3677	0.0498	0.1885	0.0044	0.0492	-	-0.2898

								0.2113	
Open	0.3198	0.3261	-0.2906	0.2130	0.8526	0.4275	0.3148	0.3376	0.3463
Open	0.2638	0.2620	-0.3336	0.3368	0.7851	0.4400	0.3674	0.2981	0.2402
Open	0.1918	0.2820	0.0128	0.0542	0.3509	0.1940	0.2316	0.1045	0.1563
PS1.1	0.3842	0.2009	-0.2823	0.1645	0.1556	0.5057	0.3199	0.5411	0.5342
PS1.2	0.4615	0.3112	-0.2849	0.1891	0.4362	0.6280	0.4925	0.4733	0.4322
PS1.3	0.2499	0.3960	-0.2724	0.2703	0.4227	0.5939	0.4311	0.3042	0.2015
PS2.1	0.1860	0.3197	-0.3320	0.1982	0.3659	0.5178	0.4651	0.3290	0.2883
PS2.2	0.2328	0.1551	-0.3161	0.2690	0.2070	0.4547	0.4534	0.3484	0.2964
PS3.1	0.4324	0.2565	-0.3020	0.2255	0.2592	0.6144	0.3921	0.4390	0.4033
PS3.2	0.3067	0.3613	-0.3558	0.1651	0.4683	0.5960	0.4715	0.3732	0.3714
PS4.1	0.3201	0.2557	-0.2578	0.3050	0.2400	0.5479	0.4460	0.3674	0.3353
PS4.2	0.3138	0.2983	-0.1623	0.2942	0.3777	0.5290	0.4720	0.2966	0.3089
PS4.3	0.3196	0.1198	0.0265	0.1407	0.0529	0.4088	0.2615	0.2246	0.1741
PS4.4	0.4507	0.2947	-0.2112	0.3065	0.1717	0.6183	0.5922	0.5269	0.4237
PS5.1	0.3278	0.3133	-0.1274	0.2427	0.2459	0.6016	0.5274	0.4555	0.3251
PS5.2	0.2584	0.2888	-0.2561	0.2629	0.3057	0.6084	0.5536	0.3865	0.3131
PS5.3	0.2018	0.1698	-0.1825	0.3135	0.1807	0.4417	0.4538	0.2513	0.2761
PS6.1	0.2677	0.3684	-0.2418	0.2844	0.3405	0.5051	0.3551	0.4155	0.3504
PS6.2	0.3210	0.2984	-0.2428	0.2718	0.2325	0.5757	0.4036	0.4007	0.4239
PS7.1	0.3982	0.3625	-0.1506	0.3548	0.2913	0.5886	0.4629	0.3414	0.2993
PS7.2	0.2176	0.1994	-0.1333	0.2925	0.2815	0.5753	0.4232	0.3816	0.4142
PS8.2	0.1709	0.1045	-0.1690	0.4123	0.1420	0.3877	0.3892	0.3647	0.3723
PS8.3	0.2063	0.0669	-0.2993	0.3815	0.1600	0.5081	0.5969	0.4784	0.3891
PS9.1	0.2384	0.2369	-0.2579	0.2534	0.2808	0.4873	0.4895	0.3518	0.2183
PS9.2	0.3716	0.2622	-0.3450	0.4441	0.4415	0.5213	0.4241	0.3962	0.2630
PS10.1	0.3492	0.2592	-0.3776	0.1116	0.3113	0.5558	0.3494	0.4476	0.3660
PS10.2	0.4011	0.3609	-0.4157	0.1938	0.2741	0.5499	0.4326	0.3880	0.2755
PS11.1	0.3769	0.1436	-0.4282	0.1054	0.3518	0.5198	0.3165	0.3073	0.3076
PS11.2	0.4189	0.1879	-0.3044	0.0974	0.2296	0.4813	0.3642	0.3522	0.3451
PS11.3	0.1255	0.1271	-0.1807	0.2505	0.2188	0.3319	0.2871	0.3315	0.3907
PS12.2	0.1726	0.1653	-0.2116	0.1669	0.0800	0.3383	0.2840	0.3350	0.3435
PS12.3	0.2435	0.1956	-0.3072	0.2827	0.1433	0.4561	0.3835	0.3994	0.3822

PS13.1	0.4230	0.2533	-0.2449	0.3883	0.3921	0.5382	0.4206	0.4302	0.2897
PS13.2	0.2813	0.2816	-0.2149	0.2021	0.1742	0.4646	0.3369	0.3198	0.2074
PS14.1	0.2357	0.3007	-0.2045	0.0395	0.1356	0.4277	0.2494	0.2100	0.1199
PS14.2	0.3717	0.2873	-0.1785	0.1243	0.2651	0.5744	0.3843	0.3651	0.3062
PS14.3	0.3933	0.3288	-0.4055	0.2662	0.4167	0.5771	0.4702	0.4128	0.3611
CS1.1	0.1946	0.4735	-0.2887	0.3487	0.3721	0.5054	0.5988	0.4016	0.3431
CS1.2	0.2709	0.3897	-0.1834	0.3773	0.2327	0.5320	0.6535	0.3238	0.2616
CS2.1	0.2452	0.1923	-0.3632	0.2965	0.1605	0.4709	0.6114	0.3303	0.2642
CS2.2	0.2986	0.1164	-0.2591	0.3067	0.2457	0.4864	0.6191	0.4390	0.4205
CS2.3	0.3718	0.2222	-0.2693	0.3875	0.2628	0.4918	0.6083	0.4514	0.4418
CS3.1	0.2795	0.3113	-0.2648	0.3856	0.2643	0.5020	0.6329	0.4245	0.3474
CS3.2	0.4017	0.2957	-0.2713	0.2781	0.3443	0.5304	0.6468	0.3996	0.3586
CS4.1	0.2592	0.2719	-0.2212	0.2730	0.2505	0.4319	0.6414	0.4392	0.4200
CS4.2	0.3096	0.2702	-0.1776	0.3101	0.2625	0.5421	0.6151	0.5705	0.5129
PSS1.1	0.2722	0.1657	-0.2424	0.3831	0.2285	0.4214	0.3715	0.5494	0.3981
PSS1.2	0.4925	0.3206	-0.4718	0.3406	0.3991	0.6109	0.5505	0.7335	0.5457
PSS2.1	0.0999	0.0711	-0.1769	0.2958	0.3062	0.3443	0.3657	0.3552	0.1741
PSS2.2	0.1454	0.0834	-0.1589	0.0925	0.0957	0.4107	0.3612	0.3322	0.1614
PSS3.1	0.3064	0.1038	-0.3315	0.2341	0.0388	0.3952	0.3402	0.4559	0.2470
PSS3.2	0.1755	0.1863	-0.2356	0.2469	0.1043	0.3610	0.4394	0.5500	0.3784
PSS4.1	0.4908	0.2318	-0.4672	0.2874	0.3649	0.5489	0.4930	0.8146	0.8050
PSS4.2	0.2893	0.1727	-0.3463	0.2560	0.1725	0.4347	0.3167	0.7265	0.7488
PSS5.2	0.4311	0.3745	-0.2816	0.2801	0.2786	0.4506	0.5018	0.6651	0.7101
PSS5.3	-0.01323	0.1457	0.0427	0.1456	0.0004	0.1219	0.1884	0.0819	0.1259
SE1	-0.0703	0.2092	-0.0678	0.2421	0.2378	0.0978	0.1842	0.0531	0.1917
SE2	0.2767	0.3415	-0.2494	0.1272	0.2851	0.3400	0.3146	0.4541	0.5954
SE3	0.1494	0.2347	-0.2064	0.0874	0.2354	0.3102	0.1880	0.2560	0.3815
SE4	0.0718	0.0771	-0.2599	0.0609	0.0009	0.2935	0.2029	0.2445	0.4536
SE5	0.1118	0.1587	-0.2548	0.2271	0.1645	0.4016	0.4592	0.3866	0.5548
SE6	0.1552	0.1503	-0.3027	0.2665	0.2856	0.2833	0.4350	0.3495	0.5205
SE7	0.4908	0.2318	-0.4672	0.2874	0.3649	0.5489	0.4930	0.8146	0.8050
SE8	0.2893	0.1727	-0.3463	0.2560	0.1725	0.4347	0.3167	0.7265	0.7488

SE9	0.4311	0.3745	-0.2816	0.2801	0.2786	0.4506	0.5018	0.6651	0.7101
SE10	-0.0132	0.1457	0.0427	0.1456	0.0004	0.1219	0.1884	0.0819	0.1259

Thus constructs are validated through convergent, discriminant validity and confirmatory factor analysis.

3.2.6 Criterion Validity

Criterion related validity is the degree to which measurement instrument can predict a variable that is designated as a criterion. It is concerned with detecting the presence or absence of one or more criterion considered to represent constructs of interest. Criterion validity for transferable skills is tested by examining the R^2 value obtained for the construct whose value depicts the extent of representation by the independent variables, namely the personality characteristics viz., openness, conscientiousness, extroversion, agreeableness and neuroticism with the moderating effect of self-efficacy. PLS path modelling technique is used to obtain R^2 .

PLS (Partial Least Squares) is a popular method for constructing predictive models when the factors are many and highly collinear. The emphasis is predicting the responses and when there is no limit to the number of measured factors then PLS can be the useful tool. The PLS path analysis enables bootstrapping by re-sampling of data. Bootstrapping technique validates a multivariate model by drawing a large number of sub samples, estimating models for each sub sample. Estimates from all the sub samples are then combined by calculating the mean of each estimated coefficient across all the sub sample models. Bootstrapping the data, results in a parametric normal data. The t value and R^2 values obtained after bootstrapping the data is used to examine the strength of association between the variables and the extent of the impact of independent variables on dependent variable.

Coefficient of determination (R^2) is the percentage of the total variation in the dependent variable explained by the independent variable. Therefore, the R^2 value of personal skills, communication skills and problem solving skills is 0.429, 0.407 and 0.920 respectively describes that 42.9%, 40.7% and 92% of the variation of the transferable skills is explained by the constructs of personality characteristics through self-efficacy mediation as shown in the figure 3.1. Heiman (1998) suggests that the value above 25% proportion of variance is considered to be a good fit. Hence it is demonstrated that the items in the instrument are with high criterion validity.

3.3. Path Validity and Model validation

The t-statistic of the various items from the measurement model is tested to ensure path validity. The t-statistics should be above 1.96 at 95% level of significance (Boudreau, Gefen and Straub, 2000). Items with significant t values are retained and others were removed after careful examination of their relevance in the constructs. The path validity is ensured and the measurement model is used to confirm the final number of items in each construct and hence the instrument is validated. The structural model depicted the significance of relationships between the constructs. T value is analysed to study the relationship between the constructs. The tested model with the R² values and t- values are given in Figure 3.1.

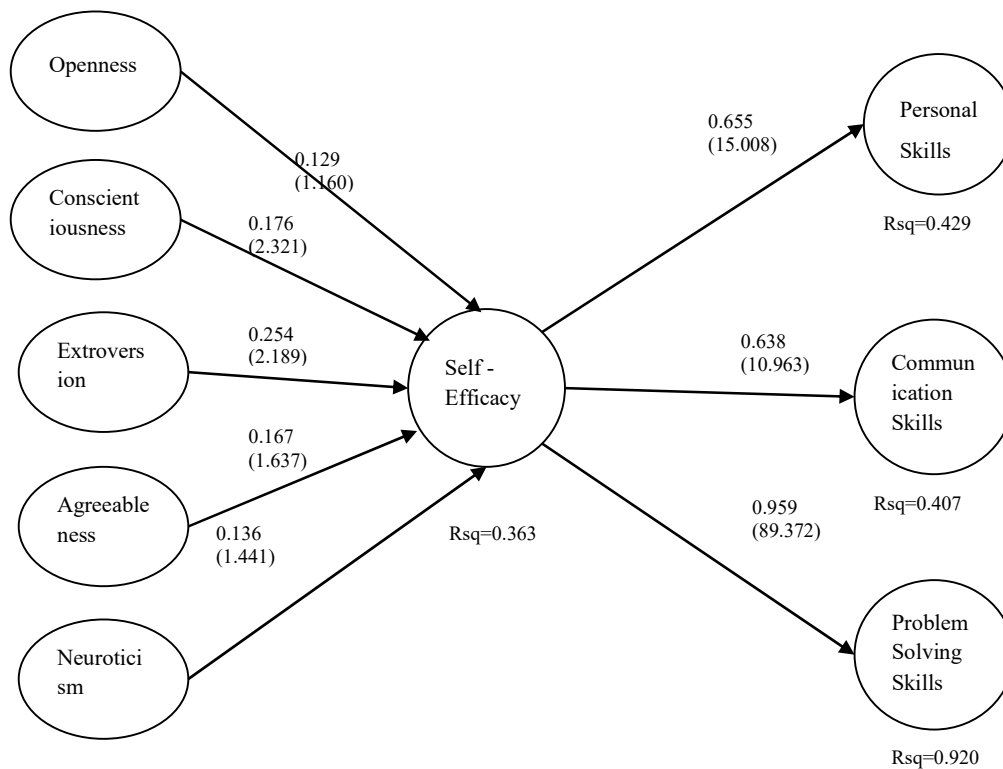


Figure 3.1 Tested conceptual model depicting the relationship between Big Five Personality Traits and Transferable Skills and the moderating role of Self-efficacy

The values shown in the parentheses are the t-values that assess the statistical significance between the constructs. It is obtained after bootstrap and describes the relationships between the variables in the model.

The above model depicts the criterion validity of the dependent variables namely, transferable skills and self-efficacy. The instrument and the model may be used for assessing the transferable skills of the students or prospective employees, as the r^2 values are $> 25\%$ and hence satisfy the criterion validity of the instrument.

3.4. Population, Sample Size determination and Sampling

Population

The population of the study consists of the students pursuing under graduation or post-graduation or professional course in arts and science colleges affiliated to Bharathiar University in Coimbatore. There are 61 arts and science colleges under Bharathiar University (source: MHRD 2015). About 60,000 students pursue different under graduation and post-graduation courses through this university (source: MHRD, 2015). Among them students pursuing Graduation - final year, Post-Graduation - any year and students pursuing professional studies like MBA and MCA - any year during the academic year 2014 and 2015 are considered as the target population for the study.

Sample Size determination

The appropriate sample size is determined through the methodology given by Krejcie and Morgan, (1970). According to them there is relationship between sample size and total population. The table developed by Krejcie and Morgan, (1970) reveals that population increases the sample size at a diminishing rate and remain relatively constant at more than 380 cases. In order to simplify the process of determining the sample size Krejcie and Morgan, (1970) table is taken as a base. Hence for 20,000 units of population it is suggested to select 1425 students as the sample.

Sampling

Sampling is done using two stage sampling method. In the first stage, the colleges were selected using systematic sampling. The sampling frame consisting the list of the colleges is used to select every 3rd item. Therefore, among the 61 arts and science colleges affiliated under Bharathiar University, every 3rd item was selected and arrived at 20 colleges.

At the second stage sampling, the enrolment cum attendance register information has been collected from the select 20 arts and science colleges. The consolidated register

contained about 20000 students and the sample size as referred from the table developed by Krejcie and Morgan, (1970), that is 1425 items were selected as final sample.

3.5. Data collection

The 1425 questionnaires were administered to students at twenty Arts and Science Colleges affiliated to Bharathiar University. The time period of the study is between September 2014 and March 2015. Finally the data of 1274 responses are been elicited with a response rate of 89.40% from twenty Arts and Science Colleges.

3.6. Data analysis

The data collected is analysed using the IBM SPSS Software. The percentage analysis is employed to describe the demographic profile of the students pursued different courses in different colleges. The mean scores are used to explain the type of personality, transferable skills of students and the level of self-efficacy of students. The standard deviation and mean statistics are also used. The impact of demographic details on personality characteristics and transferable skills and self-efficacy is found through t-test and ANOVA. To find the significantly different groups, post hoc tests are performed. Correlation analysis, Chi- square tests, discriminant analysis and Partial Least Square Modelling is used to in order to examine the influence of personality characteristics on transferable skills and mediating effect on self-efficacy on transferable skills on self-efficacy. The tests identified significant relationship between the variables of the study.

3.6.1. Descriptive Statistics

The descriptive statistics of mean and standard deviation is assessed for the study variables. Mean is arithmetic average of the scores, calculated by adding all the scores and dividing by the total number of scores. The standard deviation is a measure of the spread of the scores within a set of data. A standard deviation close to 0 indicates that the data points tend to be very close to the mean of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values. Mean and standard deviation has been found for personality characteristics, transferable skills and self-efficacy.

3.6.2 T test - The association between demographic characteristics, personality and transferable skills

The means of personality characteristics was calculated according to demographic details. T-test assesses whether means of two groups are statistically different from each other.

3.6.3. Chi-square test – Relationship between categorical variables

Chi-square test is a test for the ‘goodness of fit’ between observed and expected data. It is used to compare observed data with the data expected according to a specific hypothesis. Chi-square tests always the null hypothesis which is stated that there is no significant difference between the expected and the observed result. The relative standard for accepting or rejecting the hypothesis is at $p > 0.05$ the value is that probability that the deviation of the observed from that expected is due to chance alone. Hypothesis set for the chi-square test is as follows:

3.6.4. ANOVA –Difference in perception of study variables based on demographic characteristics

ANOVA investigates any number of factors which are hypothesised or said to influence the dependant variable. Also it can investigate the differences amongst various categories within each of these factors which may have a large number of possible values (Kothari and Garg, 2013). Further, post hoc tests are conducted at 5% level of significance, if there is significant difference among means of more than two groups. If the groups are significantly different, multiple comparison tables are obtained. Using this, two means are considered to be significantly different if the absolute difference in their corresponding sample means is greater than a specified threshold value (Elliot and Woodward, 2007). This is indicated by the p value and F value.

3.6.5. Pearson Correlation – Relationship between personality, transferable skills and self-efficacy

Correlation analysis is defined as association between two variables. The whole purpose using correlations is to figure out which variables are connected. The correlation is represented by r. The correlation coefficient is used to measure the strength of linear

association between two variables, where the value $r = 1$ means a perfect positive correlation and the value of $r = -1$ means a perfect negative correlation.

3.6.6. Regression analysis – Impact of personality on transferable skills, personality on self-efficacy and self-efficacy on transferable skills

Regression analysis is used to understand which independent variables are related to the dependent variable and to explore the forms of these relationships. The objective of regression analysis is to use the independent variables whose values will predict the single dependent value selected. Using this method, it can be studied that the changes in the value of dependent variable results by the changing the values of independent variables.

The coefficient of determination (R^2) is the measure of the proportion of the variance of the dependant variable about its mean that is explained by the independent variable. The coefficient can vary between 0 – 1. The quantity of R^2 is called as coefficient of determination and is used to evaluate the goodness of the fitted model (Kothari and Garg, 2013). When the R^2 is greater than 25% the proportions of the variables are considered substantial.

Selection of best predictor of the dependent variable is done through stepwise estimation method. Additional independent variables are selected in terms of the incremental explanatory power, they can add to the regression model. Step wise regression resulted in bringing out the important predictor variables that has a major impact on transferable skills and self-efficacy are represented by beta coefficients. Beta coefficients are standardised regression coefficients that allows for a direct comparison between coefficients as to their relative explanatory power of the dependent variable (Hair *et al.*, 2003). The un-standardized coefficients are used to derive the regression equation.

3.6.7. Discriminant analysis – Discriminating high and low transferable skills based on different attributes of personality

Discriminant analysis involves deriving a variate, the linear combination of the two or more independent variables that will discriminate the best between a priori defined groups. The discriminant function is a variate of the independent variables selected for their discriminatory power used in the prediction of group membership. The predicted value of the discriminant function is the discriminant Z score, which is calculated for each respondent.

The discriminant loading which is the measurement of the simple linear correlation between each independent variable is calculated. The loadings and the Z score are calculated whether or not an independent variable is included in the discriminant function. The discriminant loadings are otherwise called as the structure correlation and are presented in the SPSS output as structure matrix. The correlation values when greater than 0.3 will substantially discriminate the groups (Hair *et al.*, 2003). The value was also used to measure the predictive power of the variables expressed as their rank of the predictive power. The hit ratio is analogous R^2 , reveals how well the discriminant function has classified the objects.

3.7. Hypothesis to be tested

Hypothesis is been developed based on the following objectives:

❖ To find whether students' transferable skills and self-efficacy differ according to their demographics.

H_{1a} – There is significant difference in personality characteristics and transferable skills based on the respondents' stay in home or hostel.

H_{2a} – There is significant relationship between monthly income of the students' family and their part time experience.

H_{3a} - There is significant difference in transferable skills and self-efficacy based on gender.

❖ To measure the association between personality traits and transferable skills of the respondents.

H_{4a} – There is significant association between the different study variables personality traits, self-efficacy and transferable skills.

H_{4a} (a) - There is significant association between personality traits and transferable skills.

H_{4a} (b) - There is significant association between personality traits and self-efficacy.

H_{4a} (c) - There is significant association between transferable skills and self-efficacy.

❖ To measure the impact of personality on transferable skills of the respondents.

H_{5a} – There is an impact of personality traits on transferable skills.

❖ To study the personality traits that distinguishes students with high transferability skills from students who have less transferability skills.

H 6_a – There are significant personality traits that distinguishes students skill level

❖ To explore the moderating effect of self-efficacy in the relationship between big five personality and transferable skills of students.

H 7_a – There is a significant moderating impact of self-efficacy in the relationship between personality traits and transferable skills of students

This chapter deals with the type of research design, instrument development and validation, path validity and model validation, population, sampling, data collection and the tools used for analysis in detail. The Model is validated through reliability, content validity, criterion validity, construct validity and the path validity using SPSS and PLS regression technique. The chapter also includes the hypothesis to be tested. This research methodology chapter helps to systematic process of analysing the data collected for the research.