PROJECT REPORT ON

STUDY ON CAREER SATISFCATION AND ITS INFLUECING DYNAMICS

The Maharaja Sayajirao University of Baroda

Faculty of Science

Department of statistics

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Tanvi Salat

Akash Deshmukh

CERTIFICATE

This is to certify that **Bhagyashree Patil, Rajeshwari Rajodia, Tanvi Salat, Akash Deshmukh** have successfully and satisfactorily completed the project titled: **"STUDY ON CAREER SATISFACTION AND ITS INFLUENCING DYNAMICS"** as a team in the academic year 2019-20 and have submitted the work to the Department of Statistics in fourth semester as a partial fulfilment for the degree of Master of Science in Statistics and have represented their original work. I wish them a grand success in future.

Dr. (Mrs.) Khimya Tinani
(Mentor)

Prof. V.A. Kalamkar
Head of Department
Department of Statistics
Faculty of Science,
The Maharaja Sayajirao University of Baroda

ACKNOWLEDGEMENT

This work could not have been completed without the help of these pioneers of statistics. Firstly, we would like to express our gratitude to **Dr. (Mrs.) Khimya Tinani.** As students of Master's program in Statistics, we have had the privilege to work under his excellent guidance. We have got all kinds of support and tremendous experience in collection, exploration and analysis of data. We would also like to thank **Ms. Smita Trivedi (Faculty of Management Studies)** and **Prof. Kashyap Rajput (Psychology Department of MSU)** who helped us to boost up at early stages of our project. We would like to express our gratitude to **Prof. V.A. Kalamkar**, for being so generous to provide us with all the help we needed. We are thankful for his encouragement and indispensable guidance towards the culmination of our project. We are extremely grateful to all the students of various faculties of The Maharaja Sayajirao University of Baroda for providing us with the data in form of their opinions in our questionnaire. They were highly co-operative and patient in providing us the same. We are very much thankful to all the Faculties and Staff Members of Statistics Department, Faculty of Science, The Maharaja Sayajirao of University of Baroda. Last but not the least we would like to thank our seniors, alumni members and family members for having boosted our moral throughout the preparation of this project. The support of these many people will always remain permanently attached in our memory and we are extremely grateful to them. Despite the help of so many able people, we alone accept full responsibility for any deficiencies the project may possess.

“Nowadays true career satisfaction and happiness is about fulfilling your potential, tapping into your own creativity and feeling that you can make it.”

CONTENTS

INTRODUCTION

1.1 Overview

Career is defined by the Oxford English Dictionary as an individual's **"**course or progress through life (or a distinct portion of life)**"**. Career refers to the work experience outcomes, such as status, promotion and salary that are objectively observable. While it is important to note that career satisfaction is not directly proportional to satisfaction in job while it is an outcome of the structured combination of progress – right from the educational background to professional background, advancement in ability and personality, development of knowledge and skills along with earnings promotions and other securities. When the satisfaction level is measured, the question arises on what is the impact of person's educational background (basically curriculum) on his career. Whether the selection of career was reliable and accurate for the person's call. Career satisfaction is an important variable in research on career development and other areas of inquiry dealing with occupations, work dynamics, and individual adjustment. Although career satisfaction is seldom the primary topic of research investigations, it is often studied as an important criterion variable in relation to many different personal and organizational factors. It should be emphasized that the term career refers to all of the work-related activities a person engages in and all of the work-related experiences a person has over the course of a lifetime.

When researchers ask people to look back over their lives and indicate how satisfied they are with their careers, several assumptions are usually made. First, a career is a concept that has meaning for people as a discrete phenomenon in its own right, as a specific domain of experience. Most people do not have to stop and think about each job they have, had and how satisfied they were with each one to tell you how satisfied they are with their careers. They think about their careers as a whole. A second assumption is that careers change over time, and satisfaction depends on advancement. A person who starts out in a higher-level job and ends up in a mid-level job will almost always be fewer careers satisfied than someone who starts out in a low-level job and ends up in a mid-level job. Thus, most scales that are used to measure career satisfaction have one or more items dealing with the progress a person has made over time in key areas such as income and job responsibility and in the development of knowledge, skills, and abilities. Third, as in most areas of satisfaction, the assessment of career satisfaction usually involves consideration of current versus desired or expected level of experience.

The major part of people's life is spent in occupational activities and these pursuits do more than simply provide income for livelihood. This is a widespread agreement that pursuing education has become crucial for them to become prepared for transition from school/college to work. Graduation or post-graduation years present the transition from the cooperatively sheltered life of the higher secondary education years to the freedom and responsibility of either further education or employment. Career guidance or career selection is widely accepted as a powerful and effective method of bridging the gap between education and world of work. Students will come though their latest formal education with knowledge of their preferences and interests because of their interactions with many stakeholders in their environment. And it is believed that proper education will lead to accomplish career goals, which further leads to purposeful career.

Career satisfaction is an overall satisfaction with the current career. It relates to the level of happiness one feel in their chosen occupation and with the work you perform as a part of responsibilities of that occupation. While job satisfaction relates to the level of satisfaction you feel towards specific aspects of your job and its environment. In other words, job satisfaction is the function of your feelings of contentment with your working conditions, environment, job benefits, work location, work relationships and the like. Career satisfaction is a subjective measure that captures employees' perceptions of their satisfaction with their overall career goals, goals for income, goals for advancement and goals for the development of new skills.

1.2. Definition of terms:

(i) Career: According to literature, a career is a sequence of employment related positions, roles, actions and experiences. A career defines how one sees oneself in the context of one's social environment, in terms of one's future plans, one's past accomplishments or failures and one's present competences and attributes. UNESCO defined a career as the interaction of work roles and other life roles over a person's lifespan including both paid and unpaid work. Career is also seen as the progress and actions taken by a person throughout a lifetime, especially related to that person's occupations. In this study, the term "career" refers to any type of professional engagement students pursue whether paid or unpaid.

(ii) Career Satisfaction: Satisfaction is a feeling, emotion or a state of mind. It is experienced when a desire or a need is fulfilled. A person feels satisfied by accomplishment, recognition, invention and service. Career satisfaction is a combination of personal fulfilment and career progress.

(iii) Career Selection: Most individuals have an interest in certain career fields or occupations. Career selection is the decision in the individual's life regarding education and ultimately the profession.

(iv) Formal Education: Formal education is a structured and systematic form of learning. This is the education of the certain standard delivered to students by trained teachers.

(v) Curriculum: In education a curriculum is a broadly defined as the totality of the lessons and academic content taught in a specific course or program.

1.3. Literature Review:

In our study the meaning of career satisfaction is an overall satisfaction with your current career. It relates to the level of happiness you feel in your chosen occupation and with the work you perform as part of the responsibilities of that occupation. In our research we are studying various factors affecting to career satisfaction such as person's education, skills and utilization, personality, interest, prestige, opportunity, social- capital and growth of an individual. It is important to recognize that job satisfaction is not exactly similar to career satisfaction but a part of it. A paraphrase given by Van Maanen (1977, p. 8), "People Make Careers as Much as Careers Make People". The history of the modern career an introduction by John Brown, Marco H.D. van Leeuwen, and David Mitch considers the historical origins of the 'modern' career beginning in the mid- to late-nineteenth century. It explores the structures shaping the modern career and the forces leading to the institutional innovations associated with modern career structures. It offers insights into alternative paths to career formation other than the 'modern' trajectory, whether for professional chemists, working class migrants to Munich, or women graduates of the prominent women's college of Cambridge University. The essays explore the forces shaping the paths of the working lives of individuals, the scope for individual men and women to respond to these forces and the factors that have influenced their responses.

Two conferences on the theme of making a career. The first was held in 2001 in Luxembourg and laid the groundwork for the second meeting, which was a session at the 2002 International Economic History Association Congress in Buenos Aires. These conferences for the first time brought together economists, historians, and sociologists who all shared an interest in describing and explaining the social and economic history of careers over the past one and one-half centuries. Lancashire, 1971; Betz, Fitzgerald, and Hill, 1989; Cytrynbaum and Crites, 1989; Dalton, 1989; Van Maanen, 1977, p.6) their joint studies gives idea of a psychological approach to the career characterizes distinctive traits of individuals with the objective of providing guidance to the employer on how he or she could make most effective use of the

individual as an employee. (Tanova et.al. 2008). Özbilginet al. (2005) describe the interaction between contextual factors and specific internal(individual) factors in the process of shaping the career. He gives an idea about how individual, environmental and relational factors are related in career developmental process. (Özbilginet al., 2005; Kyriacouet al., 2002; Ozkaleet al., 2004) gives idea about how career choices of an individual's that is influenced by multiple factors like cultural values, family background, personal attitude and career expectations and many more in his literature. Maheshwari and Krishnan (2004) have conducted a study entitled 'Career effectiveness and its determinants' to identify the factors responsible for individual and organizational career practices affecting career effectiveness. Career effectiveness was influenced by the individual, organisational factors and supervisory support. Individual factors affecting career effectiveness are career planning and knowledge of organizational politics. Performance appraisal, performance feedback, internal recruitment, formal development, training and development, information sharing (career related) and supervisory support were found to be the attributes of organizational career management practices affecting career effectiveness. The study indicates that the determinant of career effectiveness mentioned in the study significantly explains the variances of employee career effectiveness. Ramly et al. (2009) have studied the factors contributing to the career aspirations of professionals in RandD. Self-efficacy, organizational socialization and continuous improvement practices in an organization influence the career aspirations and planning of professionals. In Chapter 2 of the history of the modern career an introduction, Laura Owen discuss that career paths depend not only on occupational structures established by firms and other organizations, but also on decisions made by individuals about when to move between firms and when to change occupation. Thane's study offers a rare opportunity to directly assess the impact on personal wellbeing of the careers it documents. He examines the careers of several generations of graduates of a women's college of the University of Cambridge (Girton College) in Chapter 10. Her study draws upon responses to questionnaires sent to women graduating from Girton over the period 1920 through 1990. She was able to conduct follow-up interviews with many of the respondents as well Thane's research reveals the value of a broad definition of the working life and of the career.

Baruch (2006) has examined the changing career development patterns from stable to dynamic systems. Career development should be individual specific and organization should be an enabler and developer of career success. Career development systems have changed from stable and linear career systems into transitional and dynamic systems by strategically aligning both internal and external integration of their career practices.

1.4. Statement of the Problem:

To the knowledge of researchers engaged in this study, most of the studies done in a number of countries so far have concentrated on satisfaction in particular profession Doctors, nurses, Teachers in general for example "Career and Job Satisfaction among professional and managerial women in Norway", "The relationship diversity training, organisational commitment and career satisfaction" for the employees in Canada, The Empirical Investigation of the Predictors of Executive Career Success and many more others. This study on the other hand, is concentrated on the factors that influence career satisfaction rather than on focusing on organisation or any specific occupation. In this study the focus will be on individuals having started their jobs having at least one year of work experience and having Science stream in HSC. Hence the present study sought to establish that factors that lead to satisfaction in career with the knowledge of their educational background and their perceptions on their curriculum, while bringing out better recommendations for the departments of the university to implement the required subject area which may found lacking by the respondents. The background of the study revealed that learning years are critical for individuals because they are transitional period from college to work and career satisfaction is necessary for the fulfilment of one's life. In this study the problem statement should be "To investigate the career satisfaction level with all necessary factors influencing career satisfaction based on their career selection". If there is a failure in choosing the right career, it can lead to unhappiness and lack of productivity. Hence is important to know and be aware of what career should be chosen to lead a content life. The aim of the study was to establish the factors that influence the career satisfaction among various students from Science stream in The Maharaja Sayajirao University of Baroda.

1.5. Rationale for the study:

Several factors motivated the current study. We are all once a student and being the classroom practitioner for several years there is a realisation that students who enrol at universities did not always find their career fulfilling further in life. There is time when the continuously evolving world demands modernization in their employees or they expect them to have all the required skills right in the degree they pursue. Sometimes it does happen that universities teaches different and industries demand something else that has been learned. Here we can realise the need and importance to have the best fit curriculum for the students. Also learning is a lifetime process and there are many things need to be learned off campus. Some students contradict their interest while learning at universities and outside the university by working in a field different from the course they pursue. The study tries to focus on those reasons due to

which there is satisfaction or dissatisfaction in a person's career. That reason could be anything and also different for every individual. Like one may find dissatisfaction because he had to unwillingly choose that particular career or had no other choice due to location, financial condition or peer pressure etc., there may be dissatisfaction if the person finds the subject taught were very theoretical and lacking practical visualisations to better understand. Likewise, various reasons for satisfaction. What also motivated to carry out study was the knowledge of current scenario where people face problems later in the life due to career. The motive is to carry out the study that investigates factors that lead to career satisfaction among under and post Graduate students of The Maharaja University of Baroda.

1.6. Significance of the study:

The study may help departments of the university to develop or improve the quality of curriculum and teaching they provide to their students by taking into consideration the factors that influence the career satisfaction. Heads of Departments, teachers and even students are made aware of the importance of career satisfaction by applying or teaching the courses at university as this stand to benefit from this study because it highlights factors that influence satisfaction. Also, the data collected while survey will be beneficial for another parallel study on building "Higher Education Recommendation System" to help students guide and recommend course based on the satisfaction level along with the aptitude, personality and other requirements. The Statistical Society formed in the Department of Statistics at university will be using the data and findings for fulfilling their agendas. The study may also be used as a baseline study to encourage other researchers to carry out similar studies in other regions.

In present study we aim at knowing the satisfaction level in career of individuals having completed their latest formal education between 2014 to 2018. Based on the problem statement of our study that is to investigate the factors leading to career satisfaction and going through the literature review we can say career is an individual's course or progression through life. So, we study career satisfaction on the basis of personal fulfilment and individual's progression throughout the career of each individual. Considering several researches works and conducting Focused Group Discussions several dimensions of the research were filtered out, which are Education, Skills and Utilization of Skills, Personality, Interests, Prestige, Opportunity, Social Capital and overall Growth. Hence the piece of information we should be collecting in this study is about Demographic characteristics of an individual, Education based progress, Professional advancements, Growth within the journey of career, Satisfaction level within their career decision, Factors influencing satisfaction and Satisfaction level with the curriculum of

the program they acquire. In addition to this, another study is connected with this part of research which is based on building a “Higher Education Recommendation System” for the students having completed their HSC and seeking out answers to which course to pursue further. The questionnaire is developed to capture the overall scenario and tested via pilot survey. Data collection is done by survey method. Based on defined sampling frame a proper sampling method was defined and according to appropriate sampling technique, the sample size was computed. The sample has been collected via telephonic interview, that is by calling individuals at their prescribed time and questions were asked. Since due to time and other resources constrains it was not possible to reach out to each individual with science (PCM) having passed between 2014 to 2018 and have at least one year of work experience is possible to reach out.

1.8. Objectives:

While trying to investigate the factors influencing career satisfaction, the study sought to:

(i) To study factors influencing career satisfaction

(ii) To measure the level of career satisfaction amongst various disciplines.

(iii)To access the adequacy of curriculum in formal education and recommend (if any) to educational authority.

(iv) Comparative study of career satisfaction of working and non-working people.

(v) To check dependency of Career Satisfaction of working and non-working over gender, marital status, year of experience etc.

(vi) Comparison of career satisfaction of working people with their working sector.

1.9 Limitations:

The following limitations were anticipated in this study:

- Research is limited on the ones having Physics- Chemistry-Maths group of Science in HSC.
- Students from faculty of science and Faculty of Technology and Engineering from M.S. University are considered under this study.
- Taking pass outs of year 2014 to 2018 due difficulty in reaching out very old students.
- Couldn’t make out the proportion for bachelor and masters students due to overlapping of students in master.

SAMPLE SIZE DETERMINATION & SAMPLE COLLECTION METHODOLOGY

Population:

A population is the total number of pass outs or alumni between 2014 to 2018 from faculty of science and faculty of technology are the main focus of our study. The population of this study is the number of alumni of Maharaja sayajirao University of Baroda who have adopted Group A (i.e. mathematics, physics, chemistry) during their HSC. Collecting information from the entire population is not feasible for this study so a sample or subset of the population will be considered instead.

Sample size Determination:

It was projected that each individual will be interviewed by calls or asked to fill up the Google form (questionnaire) at their convenient time. There is no age group limitation, however alumni should at least have one year of experience from last degree of completion. It was expected that this would give the most random level of results and there would be enough mixed data, independent of participants' technical background or occupation along with working and non-working people. We used Power Package in R to determine the sample size. Thus, finding will be extrapolated based on the data received from this sample population.

We have determined the sample size for each objective using power package in R.

First, install the power package in R and for each of the objective of our study we have determined the sample size corresponding to the appropriate statistical tool for each of the objective in the study. So, In the R programming we run the following code to get the sample size:

For determining the effective sample size in order to achieve the required accuracy in chi-square tests, we use

pwr.chisq.test (w =, N = , df = , sig.level =, power =)

Where **w** is the effect size = 0.24 (according to Cohen's convention of medium effect size) **df** is the degrees of freedom = 20, **power** = 0.8, **ε =** Margin of error = 0.05

```
> pwr.chisq.test(w=0.24,df=20,sig.level = 0.05,power = 0.8)

     Chi squared power calculation

              w = 0.24
              N = 363.9026
             df = 20
      sig.level = 0.05
          power = 0.8

NOTE: N is the number of observations
```

n is the total sample size obtained = 363.9026

Simply for the convenience purpose, take n = 364

Similarly, we have computed sample size for each of the objective. Following table contains the objective and corresponding sample size.

Sr.no	**OBJECTIVES**	**Tools**	**SAMPLE SIZE**
1	Comparison of career satisfaction between private, gov. sector and business	ANOVA / Kruskal wallis test	57
2	Comparison of career satisfaction between working and non-working people	T-test/Mann-Whitney test	274
3	comparison of career satisfaction between male and female	T-test/Mann-Whitney test	274
4	Comparison of career satisfaction between occupation (Self-employed and job)	T-test/Mann-Whitney test	274
5	To check the association of career satisfaction with respect to Gender	Chi -square test	207
6	To check the association of career satisfaction with respect to marital status.	Chi -square test	301
7	To check the association of career satisfaction with respect to Grade of final education.	Chi -square test	**364**

8	To check the association of career satisfaction with respect to working experience.	Chi -square test	335
9	Comparison career satisfaction amongst various disciplines. (Professional and Non-professional)	T-test/Mann-Whitney test	274

From this table we have used maximum sample size which is to be 364.

Sampling Frame:

For the collection of samples, we have used two stage sampling. In first stage we have used stratified sampling, we have made strata based on department from faculty of science and faculty of technology. Then we use Proportional Allocation Method in every stratum and obtain n_i as number of sample points to be collected from each department.

$$n_i = \frac{n_{(srswor)} N_i}{N}$$

Where,

N = Total Students Passed their final education in 2014 to 2018

N_i = Total Students Passed their final education in 2014 to 2018 in each Department

$n_{(srswor)}$ = Sample size of the total population

n_i = Sample size of each department based on proportion

Sample size determination by using proportional stratified sampling for each strata (department)

		Sample Size	
Department name	**Total=Ni**	**364**	**Round off**
Physics	1167	43.2927	**43**
Chemistry	1924	71.37546	**71**
Geography	313	11.6115	**12**
Geology	483	17.91806	**18**
Mathematics	1859	68.96413	**69**

Statistics	468	17.6616	**18**
Environmental Science	530	19.66164	**20**
Civil Engineering	632	23.44558	**23**
Mechanical Engineering	384	14.24541	**14**
Electronic Engineering	215	7.975948	**8**
Electric Engineering	393	14.57929	**15**
Chemical Engineering	268	9.942112	**10**
Computer Engineering	401	14.87607	**15**
Textile Engineering	353	13.09539	**13**
Metallurgical & material Engineering	252	9.348553	**9**
Water Management and Irrigation	170	6.306563	**6**
	9812		364

Based on sample size of each department, sample points were collected using Simple Random Sampling (SRS) based on contact number list provided by each department.

RELIABILITY OF QUESTIONNAIRE

In this study, Cronbach's coefficient α was used to calculate the internal consistency coefficients of the items included in the questionnaire through a pilot study with working and non-working people. Cronbach's alpha is the most common measure of internal consistency (reliability). It is widely used when you have multiple Likert questions in a survey questionnaire. It is an important indicator of the reliability of psychometric test. In the research study, the reliability of Cronbach alpha should lie between the value of 0.7 to 0.9. Results of the reliability analysis showed that the items in questionnaire have discriminating power.
For common and working questions:

Reliability Statistics

Cronbach's Alpha	N of Items
.787	34

For common and non-working questions:

Reliability Statistics

Cronbach's Alpha	N of Items
.751	30

Reliability Statistics of this study on working and non-working pilot data is Cronbach's Alpha N of Items is 0.787 and 0.751 respectively. A pilot study was conducted initially to check the reliability of the factors included in the study. Thereafter, there were no factors with a low reliability score which has be omitted and thus final questionnaire was same for actual survey. Hence, the result is considered to be good.

NORMALITY OF DATA

1. To check the Normality of the data

Section-1 (Common and working questions)

Ho: The given data follows Normal distribution.

vs

H1: The given data doesn't follow Normal distribution.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
MEAN- CAREER SATISFACTION	275	100.0%	0	.0%	275	100.0%

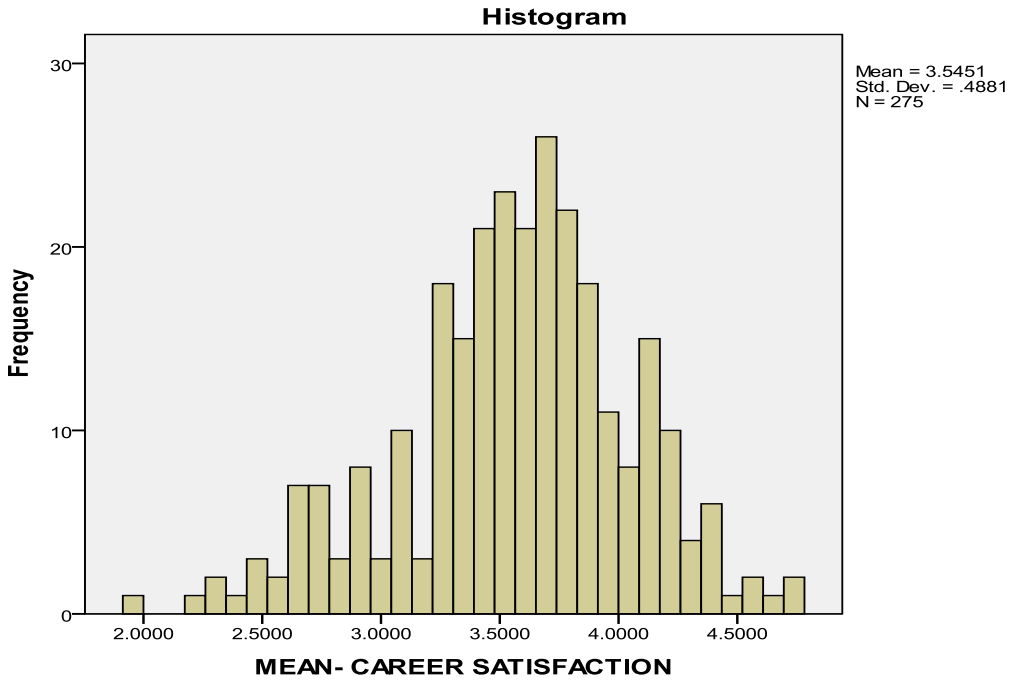
Descriptive

			Statistic	Std. Error
MEAN- CAREER SATISFACTION	Mean		3.545138	.0294311
	95% Confidence Interval for Mean	Lower Bound	3.487199	
		Upper Bound	3.603078	
	5% Trimmed Mean		3.556741	
	Median		3.565217	
	Variance		.238	
	Std. Deviation		.4880589	
	Minimum		1.9565	
	Maximum		4.6957	
	Range		2.7391	
	Interquartile Range		.5652	
	Skewness		-.426	.147
	Kurtosis		.270	.293

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MEAN- CAREER SATISFACTION	.072	275	.001	.983	275	.003

a. Lilliefors Significance Correction



Conclusion:

Since, p-value<alpha (0.05), we reject our Ho.

Therefore, the means of Section 1 we have taken under study doesn't follow Normal distribution.

Section-2 (common and non-working questions)

Ho: The data follows Normal distribution.

Vs

H1: The data doesn't follow Normal distribution.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
MEAN- CAREER SATISFACTION	89	100.0%	0	.0%	89	100.0%

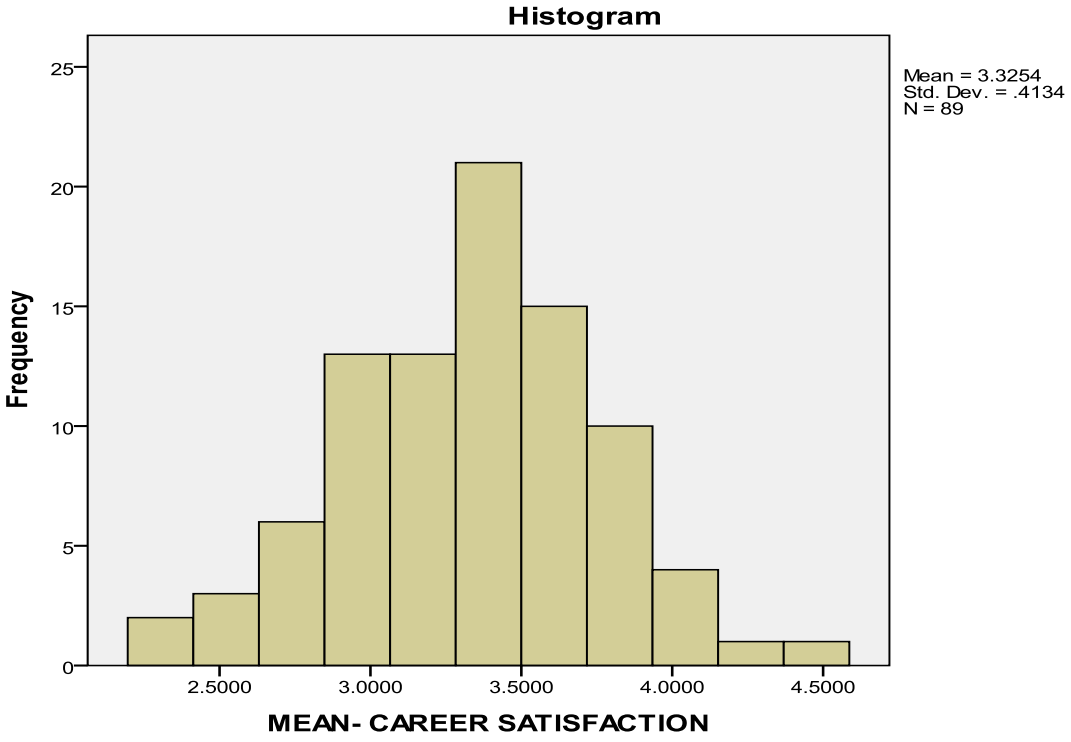
Descriptive

			Statistic	Std. Error
MEAN- CAREER SATISFACTION	Mean		3.325354	.0438162
	95% Confidence Interval for Mean	Lower Bound	3.238279	
		Upper Bound	3.412430	
	5% Trimmed Mean		3.328177	
	Median		3.347826	
	Variance		.171	
	Std. Deviation		.4133612	
	Minimum		2.3043	
	Maximum		4.3913	
	Range		2.0870	
	Interquartile Range		.6087	
	Skewness		-.127	.255
	Kurtosis		-.029	.506

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MEAN- CAREER SATISFACTION	.083	89	.171	.991	89	.782

a. Lilliefors Significance Correction



Conclusion:

Since, p-value>alpha (0.05), we do not reject our Ho.

Therefore, the means of Section 2 we have taken under study follows Normal distribution.

Section-3(only common questions)

Ho: The given data follows Normal distribution.

Vs

H1: The given data doesn't follow Normal distribution

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
MEAN	364	100.0%	0	.0%	364	100.0%

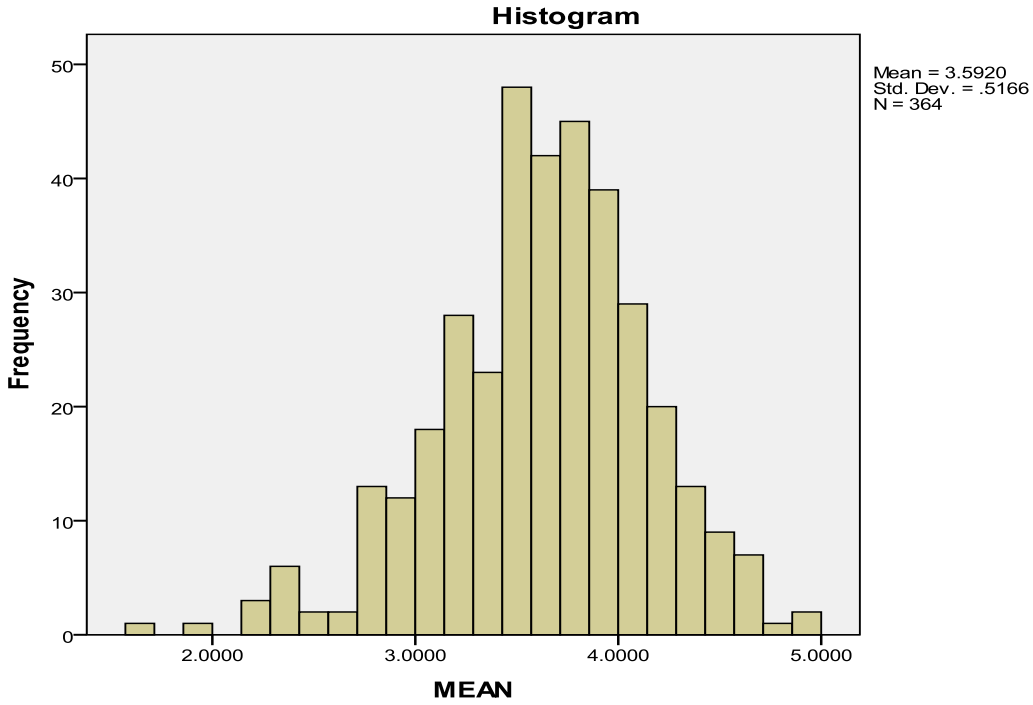
Descriptive

			Statistic	Std. Error
MEAN	Mean		3.592033	.0270794
	95% Confidence Interval for Mean	Lower Bound	3.538781	
		Upper Bound	3.645285	
	5% Trimmed Mean		3.606532	
	Median		3.642857	
	Variance		.267	
	Std. Deviation		.5166415	
	Minimum		1.6429	
	Maximum		4.8571	
	Range		3.2143	
	Interquartile Range		.6429	
	Skewness		-.473	.128
	Kurtosis		.723	.255

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MEAN	.076	364	.000	.984	364	.000

a. Lilliefors Significance Correction



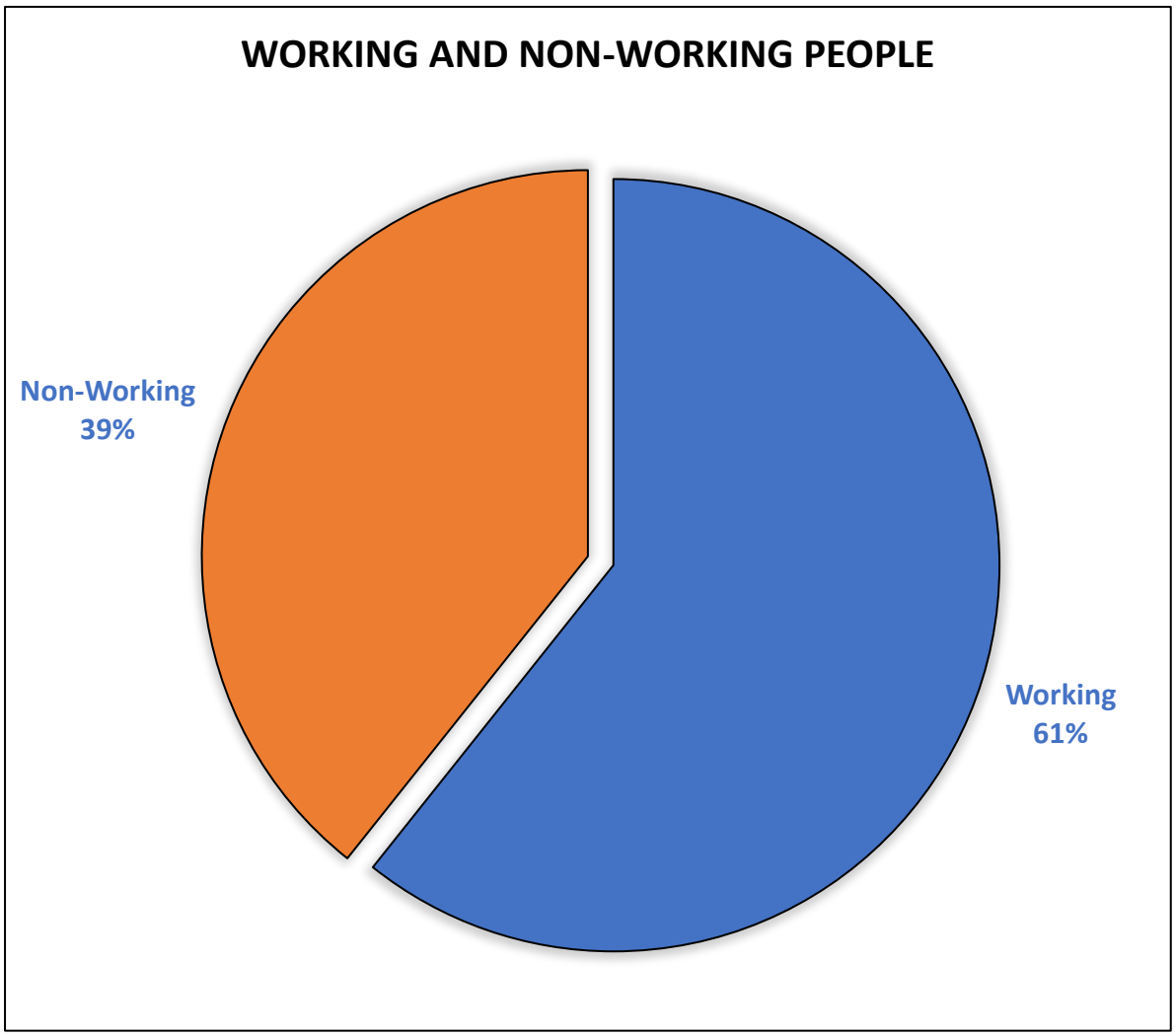
Conclusion:

Since, p-value<alpha (0.05), we reject our Ho.

Therefore, the means of Section 3 we have taken under study doesn't follow Normal distribution.

DATA VISUALIZATION

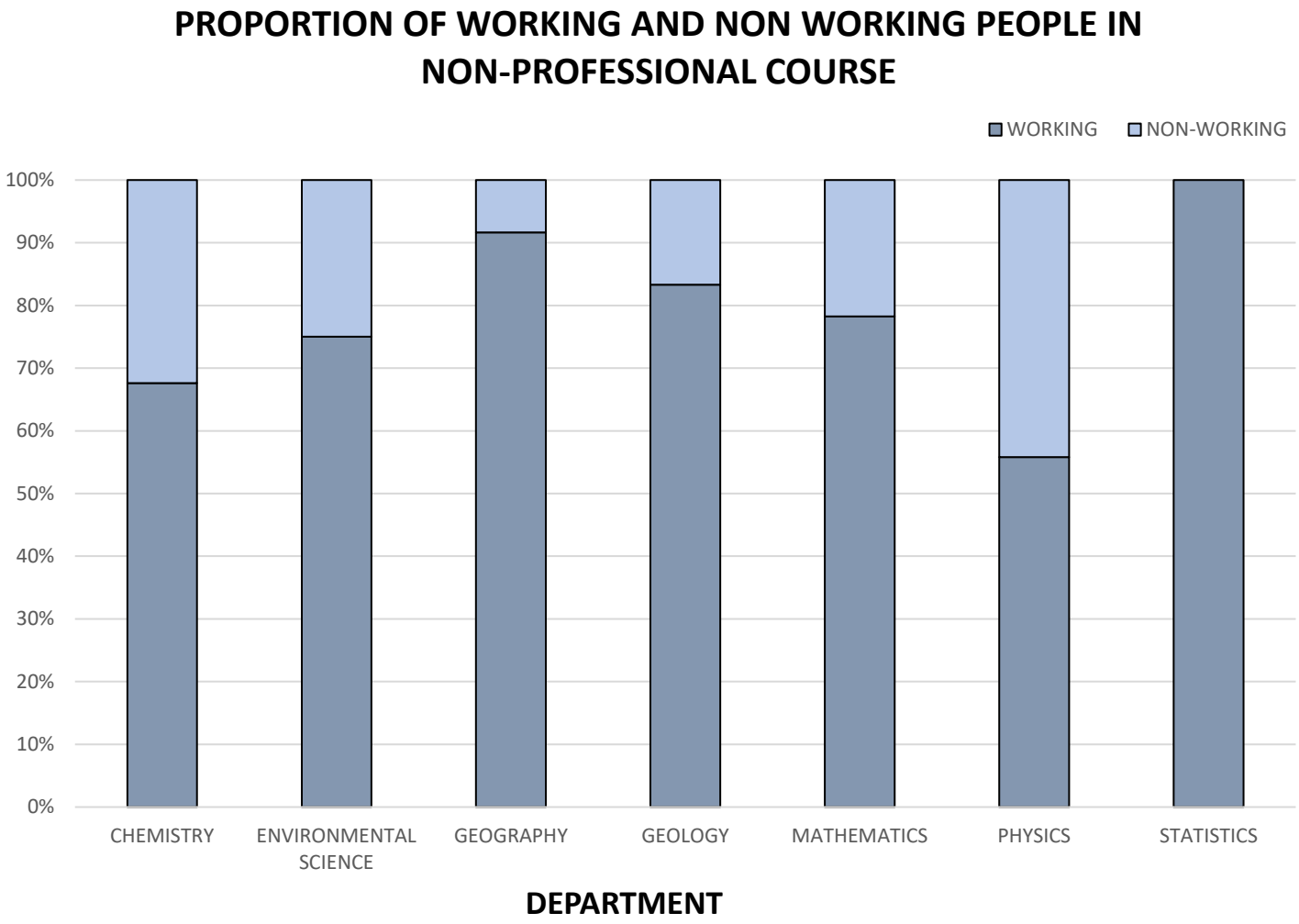
1.



Observation:

Here is the pie chart showing proportion of working and non-working people. We can see there are 61% working respondents and 39% non-working respondents in our study.

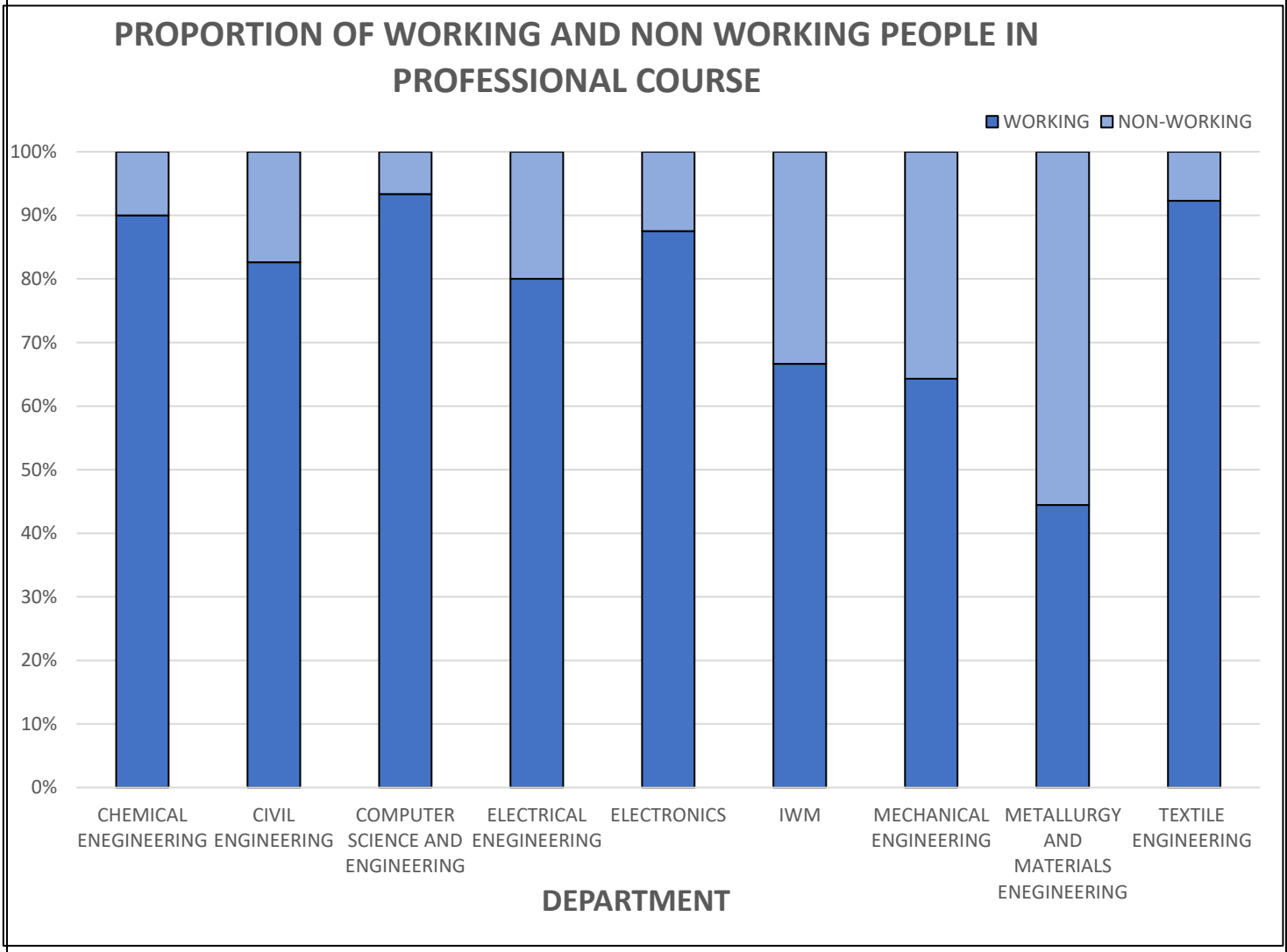
2.



Observation:

From the above graph our data base shows no non-working respondents in statistics department. It might be due to expanding opportunities in the field of statistics. Otherwise highest proportion of non-working is found in Physics department and then in Chemistry department. while the higher proportion of working respondents are recorded in Geography, Geology and Mathematics.

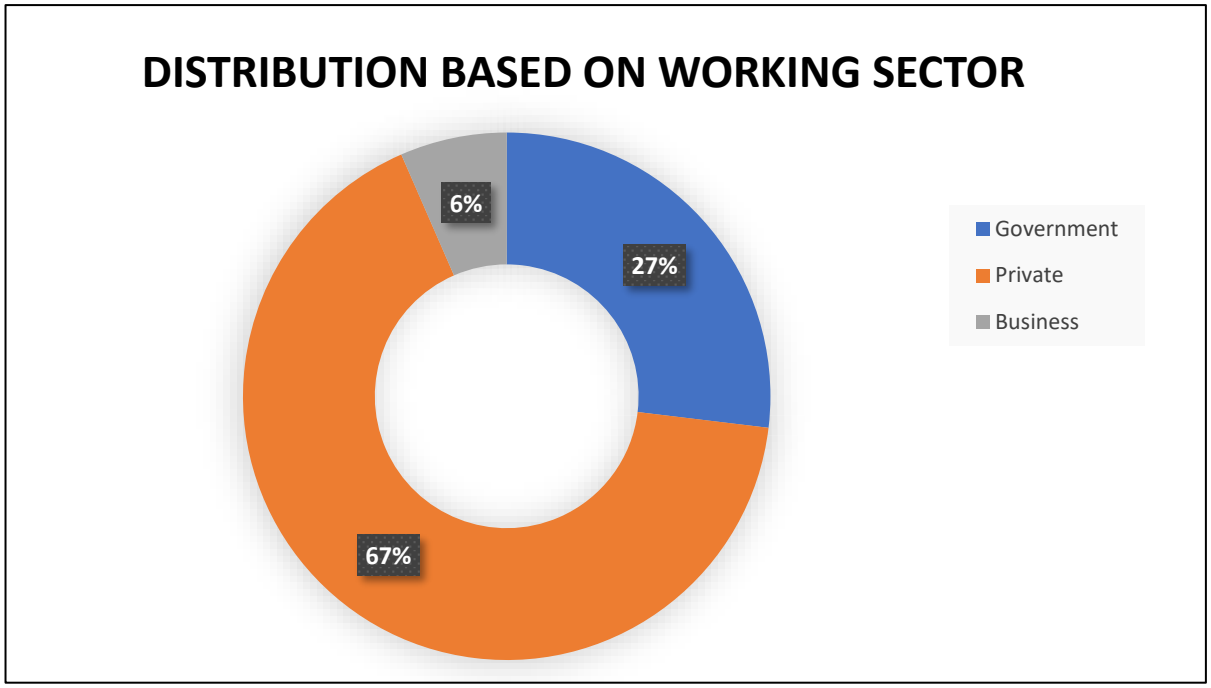
3.



Observation:

In this chart where proportion of working and non-working respondents of professional course is shown, we can observe here that maximum proportion of working category is present in Textile, Computer Science, Chemical and Electronics Engg. department, while lowest of the working is seen in metallurgy and material Engg. department. In metallurgy and material engg. more than half of the pass outs are non-working. In IWM and Mechanical there are over 30% percent of non-working pass outs.

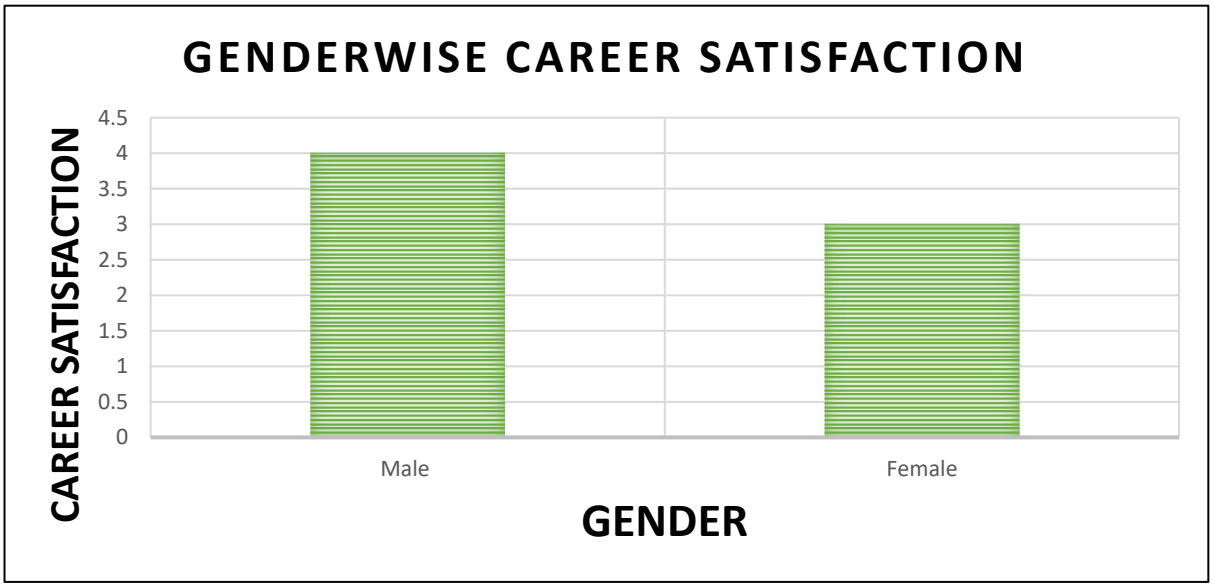
4.



Observation:

The pie chart shows the proportion if respondents under specific working sector. From the chart we can observe that 67% of the people under study is engaged in private sector, 27% are engaged in Government while only 6% is into business sector.

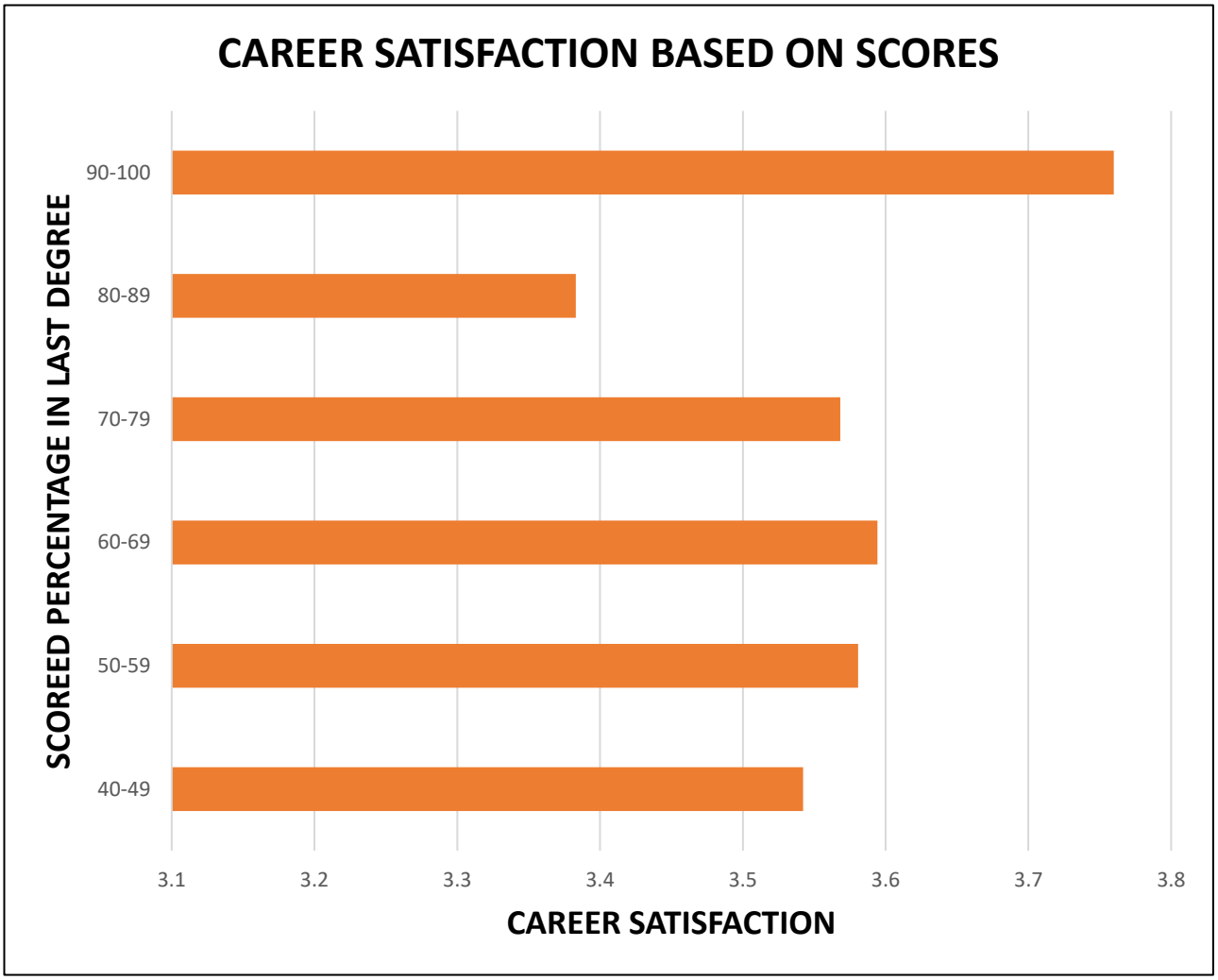
5.



observation:

The above graph shows career satisfaction between genders. The career satisfaction of male is observed more compared to female

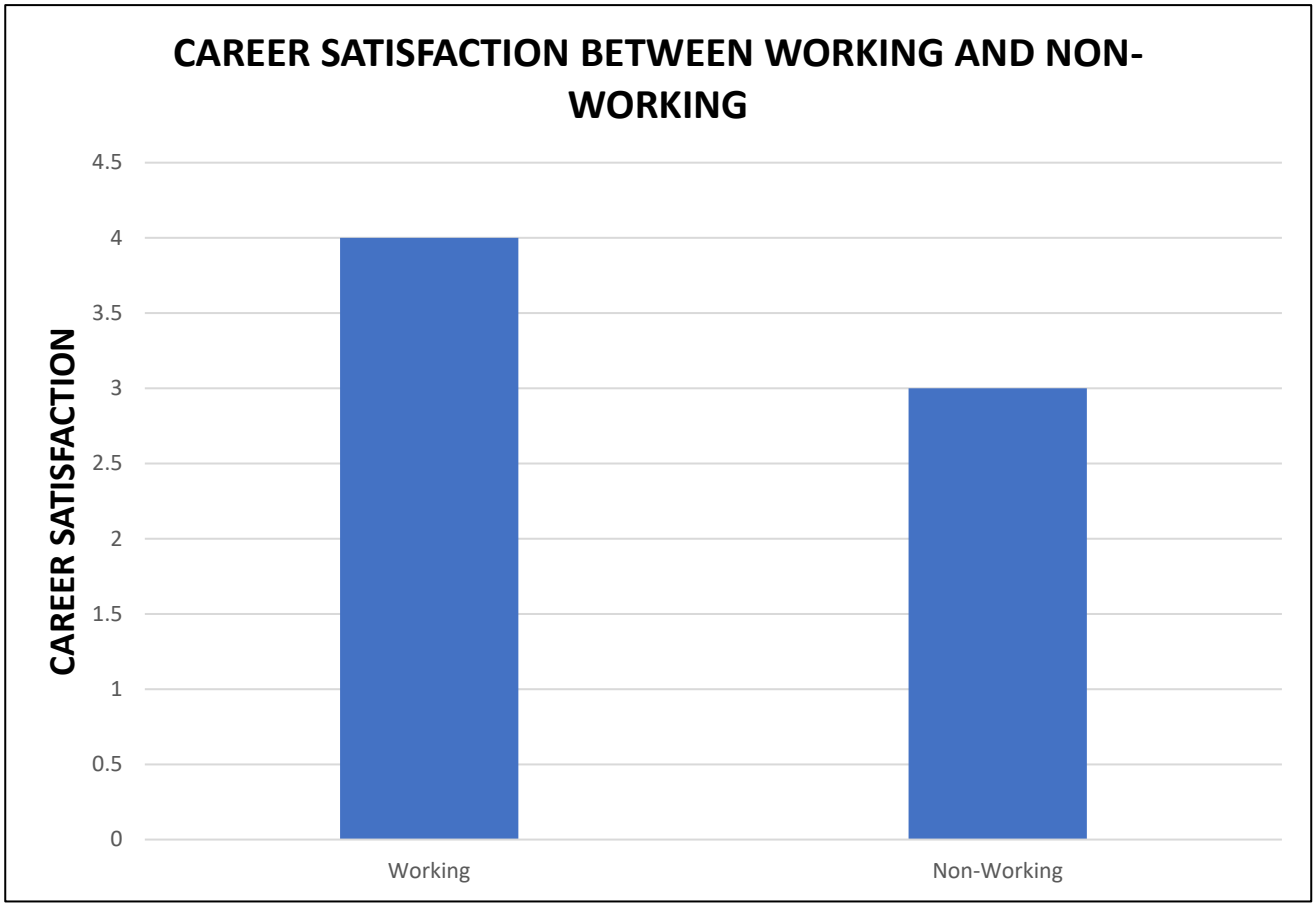
6.



Observation:

The above chart shows the career satisfaction of respondents based on the percentage scored in the last degree. The y- axis shows the percentage scored and x-axis is showing career satisfaction. The highest career satisfaction observed is 3.7 by the respondents who scored between 90-100 and the lowest career satisfaction is observed by respondents who scored 80-89 in their last degree.

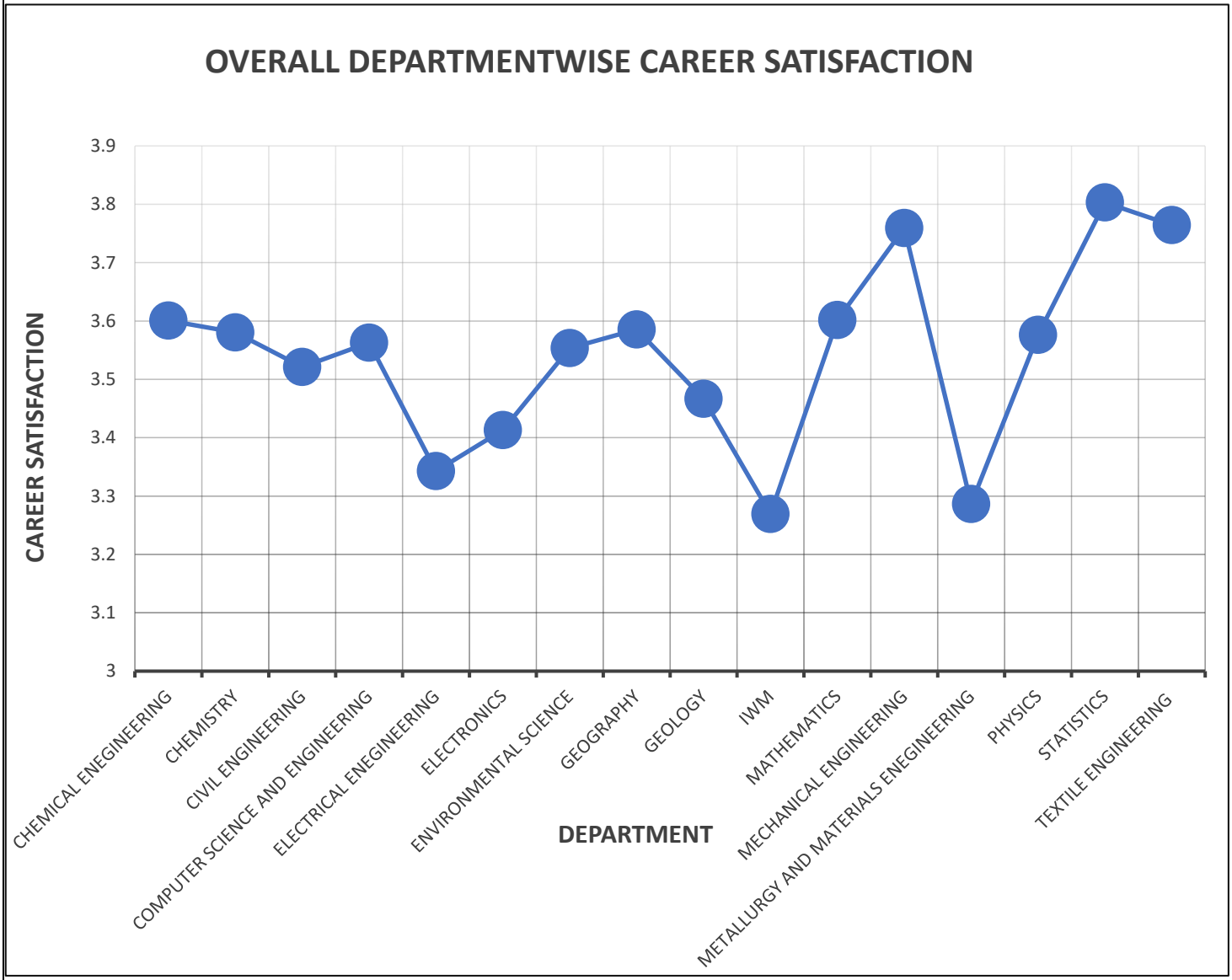
7.



Observation:

We can observe here that while x-axis is showing working and non -working, while on y -axis is the career satisfaction. The graph tries to explain the career satisfaction of working and non-working respondents. We can observe that career satisfaction is working is more than non-working.

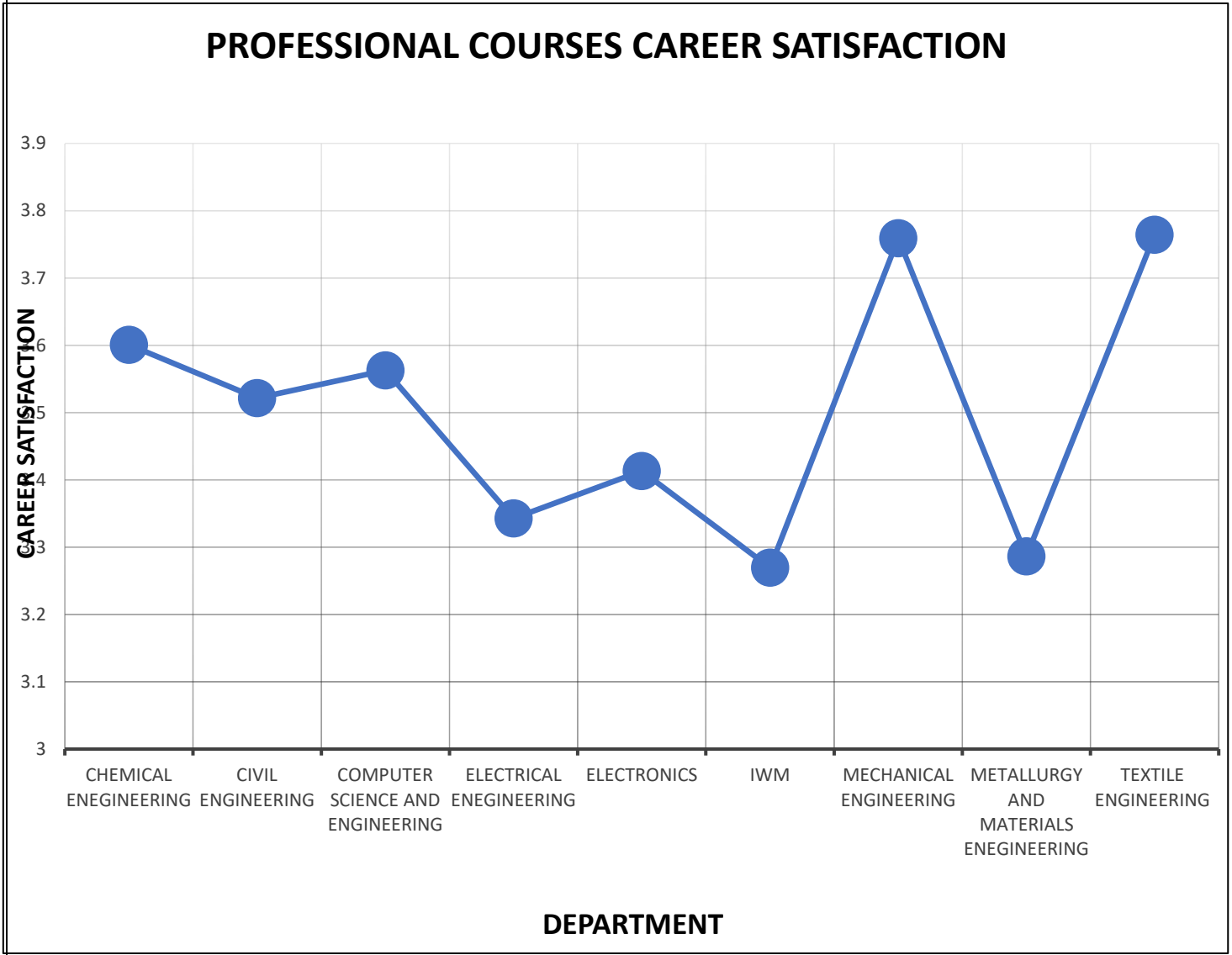
8.



Observation:

The above line diagram shows the status of career satisfaction among the various departments of Science and Technology faculty taken into study. The highest career satisfaction is observed in the Statistics from science faculty followed by Mechanical and Textile Engg. department of Technology faculty. While Metallurgy Dept shows the lowest satisfaction in their career

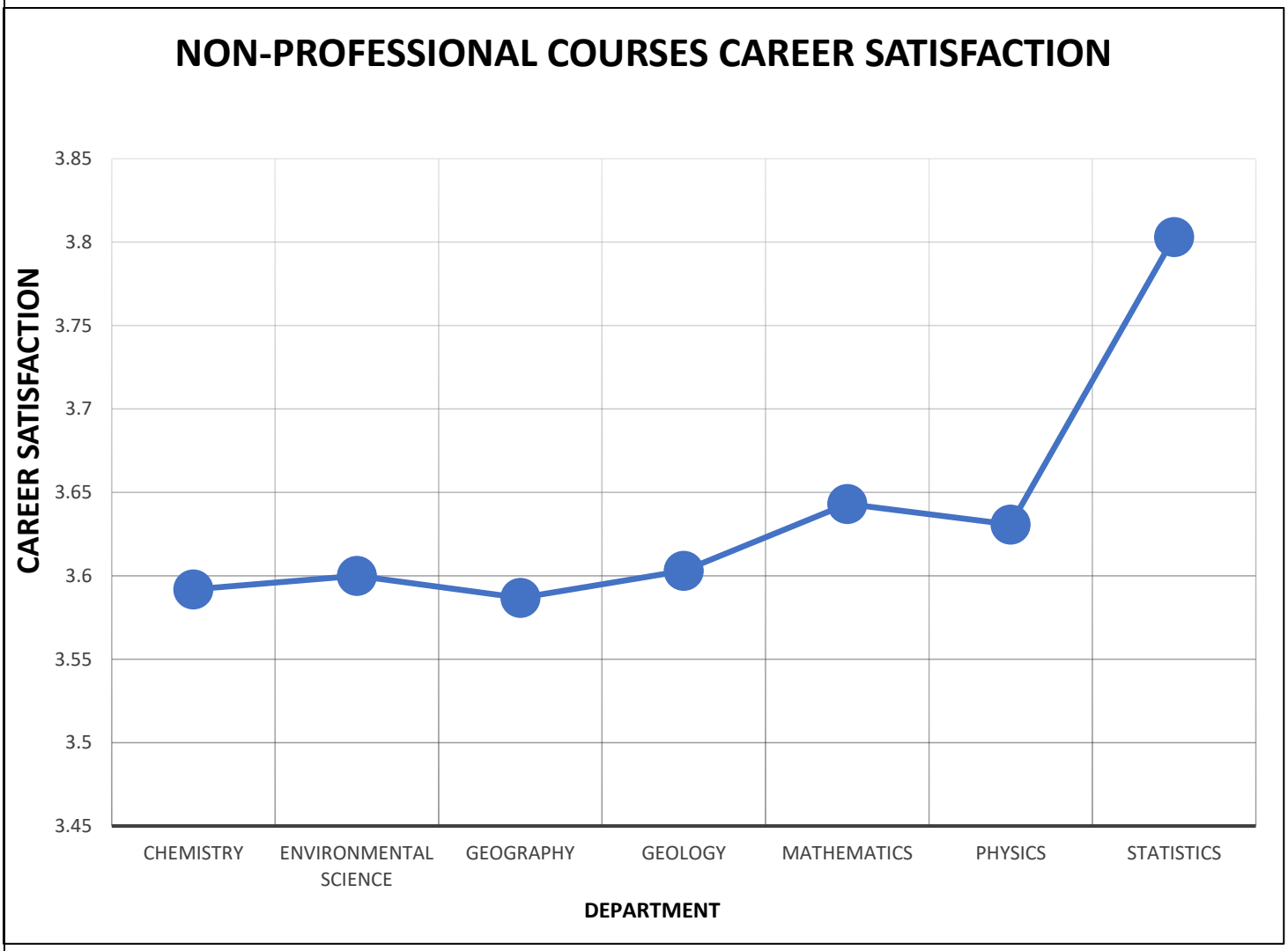
9.



Observation:

The line chart showing the Career satisfaction for professional courses, with career satisfaction on the y-axis and departments on the x - axis. The highest Career satisfaction is observed in Mechanical and Textile engineering then comes Chemical engineering. whereas lowest Career satisfaction is observed in Irrigation and water management, Metallurgy and Materials, electrical engineering and Electronics.

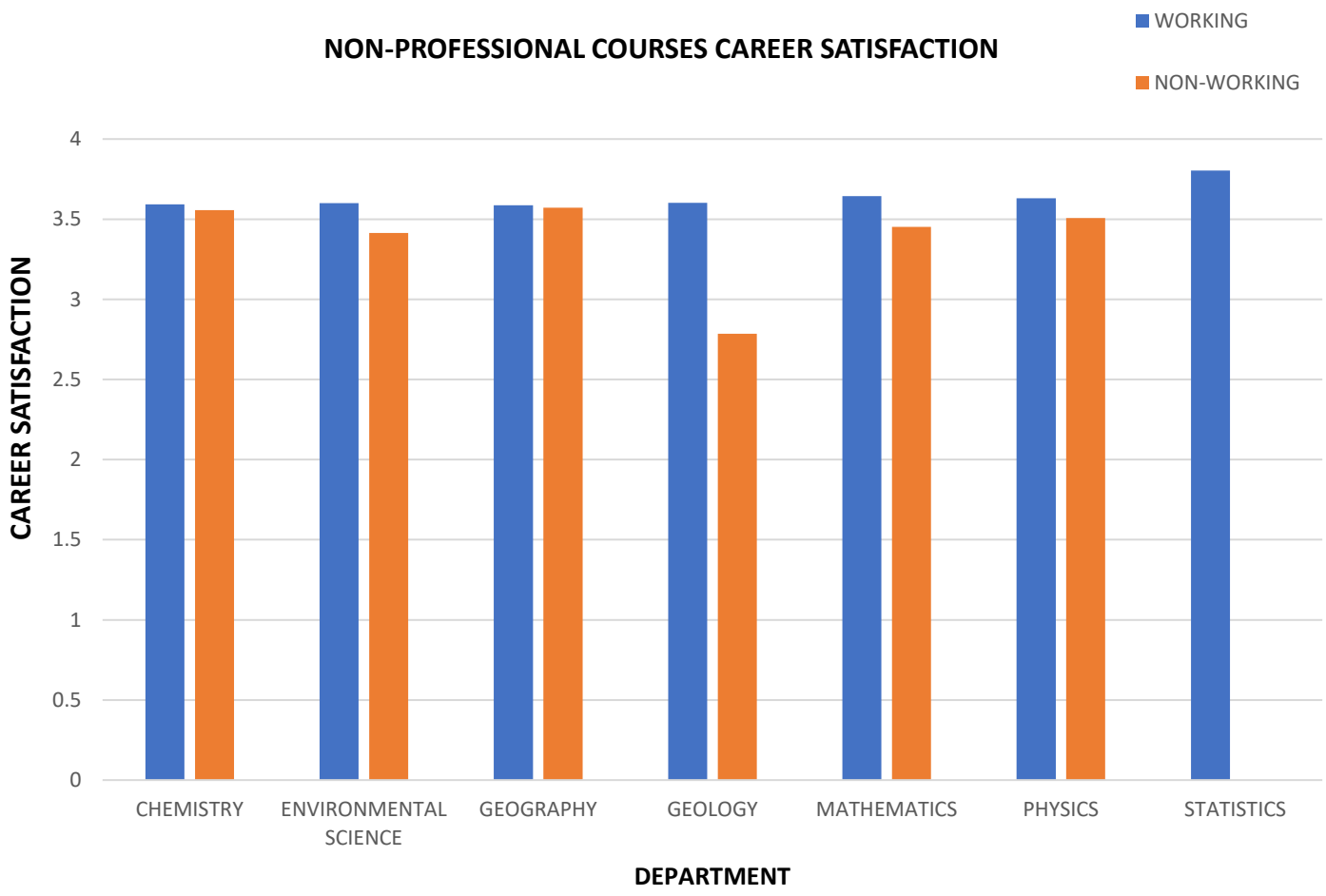
10.



Observation:

This line chart shows the career satisfaction of non-professional courses where majority of the respondents whose career satisfaction falls between 3.55 and 3.65 that is above average are Chemistry, Env. Science, Geography, and Geology. while career Satisfaction of people from Statistics is highest then all this departments which is 3.8

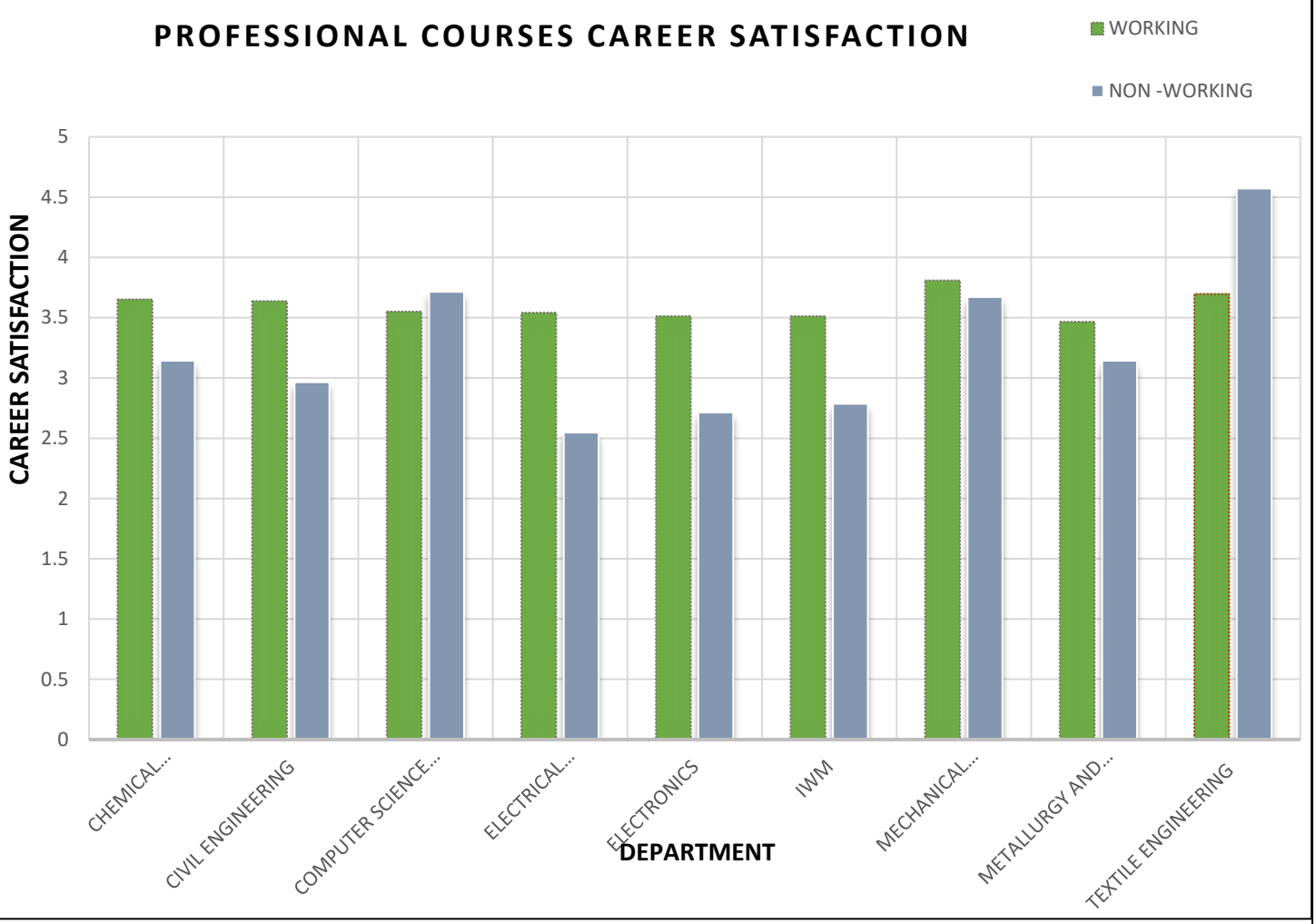
11.



Observation:

The above bar chart shows the career satisfaction in Non -Professional courses for both working and non-working respondents. The blue bars show the working respondents and orange bar is for non-working ones. Y- axis shows the career satisfaction and x - axis contains the departments under non-professional courses. Looking on the graph it can be observed that in majority of the departments, the ratio for working and non-working has very slight difference in career satisfaction. Like career satisfaction in Geography dept. is same for working and non-working both and in Chemistry dept., Env. Science dept., Mathematics and Physics dept. career satisfaction is above average and very less difference between working and non-working ones. The lowest career satisfaction is observed in Geology category of non-working people. While in Statistics dept. there is a highest career satisfaction among all the depts. and showing no non-working respondents

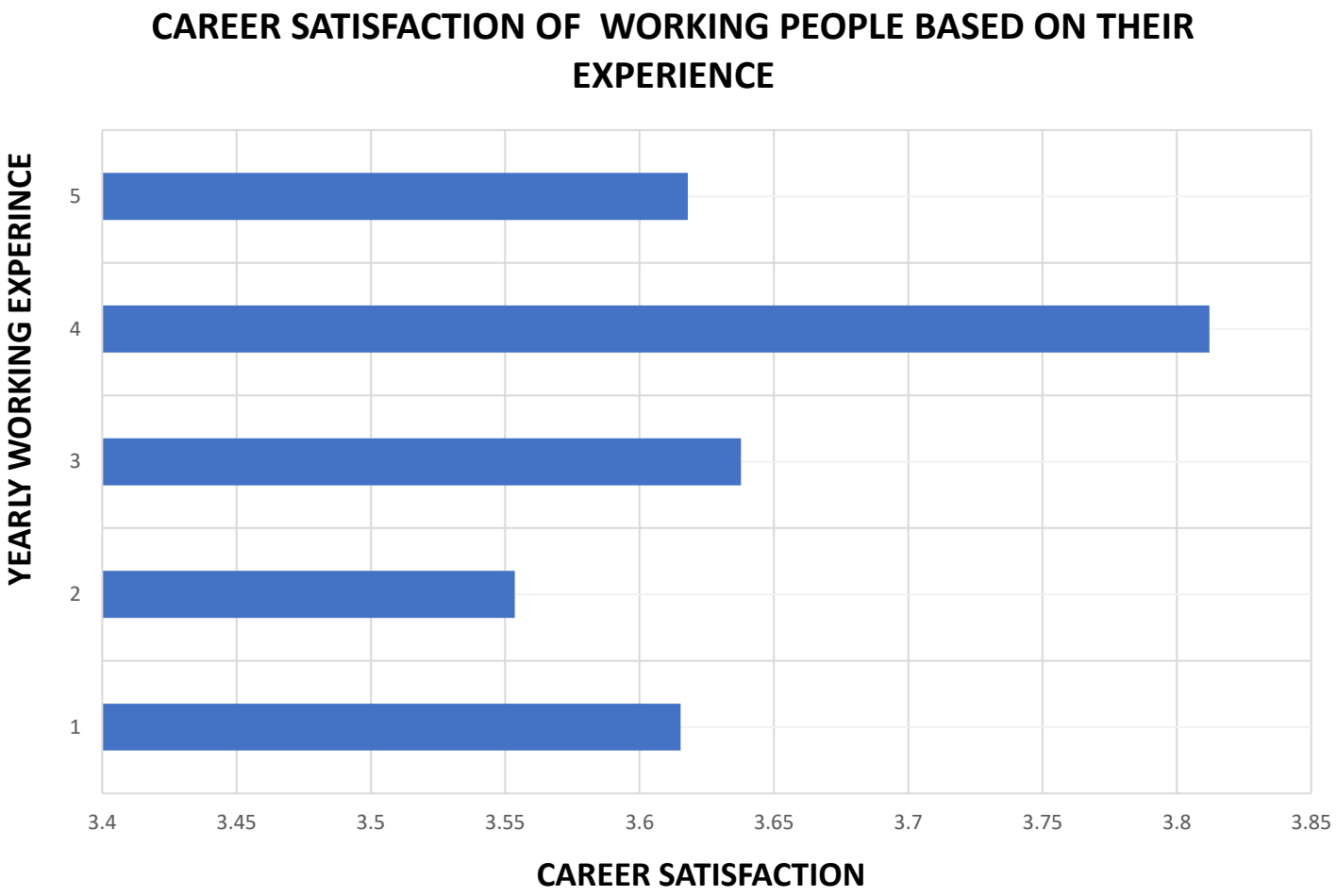
12.



Observation:

The above bar graph shows the career satisfaction in professional courses for Working and non-working respondents. The green bars are for working people and grey bar is showing non-working respondents.

13.



Observation:

The graphs show the career satisfaction with respect to their working experience in years, having years of working experience on Y- axis and level of Career Satisfaction on x-axis. The highest level of career satisfaction is observed among the people having working experience of 4 years whereas lowest career satisfaction was observed by the people with the 2 years of working experience.

•

14.

Observation:

The graphs show career satisfaction of people in various working sector. The highest career satisfaction is observed in Business sector followed by Government sector and lowest in Private sector.

WORD CLOUD

The word cloud is a visual representation of text data. A Word Cloud is an excellent option to help visually interpret text and is useful in quickly gaining insight into the most prominent items in a given text, by visualizing the word frequency in the text. In simple words word cloud is interested by the size of the words which means the single word with highest frequency will appear larger and accordingly the word with less importance or less frequency will be smaller.

1. **Reasons for NOT continuing the current career**:

Observation:

As you can see here is a word cloud showing the highest frequency of words by the size and colour. The words in bigger size are “interest”, “Less”, “opportunity”, “work”, “field”, “job”, “future” “better”, “change”, etc. By this we mean that the ones who don’t want to continue with their current career are may be due to the reasons that they find it less interesting, or less career opportunity, no better future, less jobs, less satisfies in this field, or a study problem, don’t find it a secure career, want to change it or go to different place.

2. **Reasons for continuing the current career:**

Observation:

From the above word cloud the reasons for continuing with the word cloud shows the words like “career”, “Satisfies”, “job”, “work”, “satisfies”, “yes”, “field”, “good”, “like”, “ present”, “passion”, “environment”, “opportunity”, “happy” and many such positive words. From that we can see that they are more satisfied and happier with their job. They like their work and the environment.

3. **To access the adequacy of curriculum in formal education and to educational authority.**

Observation:

On asking our respondents on what they need to have better exposure to while studying, for better career performance then the words mostly used were “soft skills”, “applications”, “practical session”, “better choices”, interactive” “session”, etc. Hence, we can conclude that students while studying need more of interactive session, practical session, applications, learn Soft skills so on. Hence, we recommend “soft skills”, “applications”, “practical session”, “interactive sessions” to educational authority

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FACTOR ANALYSIS

Factor analysis is a very useful method of reducing complexity by reducing the number of variables being studied. It is a good way of resolving the confusion of multiple variables and identifying latent or underlying factors from an area of seemingly important variables. There are two stages in factor analysis.

Stage 1 is called Factor Extraction Process where objective is to identify how many factors will be extracted from the data. The most popular method for this is known as principal component analysis. This is a rule of thumb based on computation of eigen values, to determine how many factors to extract.

Stage 2 is called Rotation of Principal components. This is actually optional but highly recommended. After the number of extracted factors is decided upon in stage 1, the next task of research is to interpret and name factors.

In our study we have used factor analysis for identifying factor of career satisfaction of category of people such as working people. As there are 23 different variables in this category, therefore factor analysis is used. The following analysis is done in SPSS software.

SPSS selection for factor analysis on common and working people's data:

/PRINT UNIVARIATE INITIAL CORRELATION SIG DET KMO EXTRACTION ROTATION

/FORMAT SORT BLANK (.4)

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/CRITERIA MINEIGEN (1) ITERATE (25)

/EXTRACTION PC

/CRITERIA ITERATE (25)

/ROTATION VARIMAX

/METHOD=CORRELATION.

Exploratory factor analysis technique was applied on the data. The correlation matrix table shows the coefficients of correlation between all the variables. The correlation matrix exhibits the simple correlation among all the pairs of variables selected for the analysis. Factor analysis

is said to be correctly applied if this matrix contains sufficient number of correlation coefficient values more than 0.30. From the analysed data, it is visible that many of the variables are highly correlated. Hence, the data is deemed to be fit for factor analysis. Correlation matrix Table of analysis is not provided here because of been too large.

TABLE:2

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.863
Bartlett's Test of Sphericity	Approx. Chi-Square	2043.997
	df	253
	Sig.	.000

In table 2, the significance and adequacy of data results are shown above. The high value of the KMO index is a symbol of adequacy. The value is considered high if it lies between 0.5 to1. For the data used in the study the KMO statistic comes out to be 0.863 which is close to 1 to ensure the appropriateness of the factor analysis. The significant value of Bartlett test Chi square indicates that the correlation coefficient matrix is not an identity matrix. The value of Bartlett's Test of Sphericity, Chi square for the present data is equal to 2043.997 with df equal to 253 and significance 0.000. Theoretically Bartlett Test is used for homogeneity of variance. i.e.

H0: $\sigma_1^2 = \sigma_2^2 = \sigma_3^2 = ... = \sigma_K^2$

H1: At least one σ_i^2 is not equal to the others.

In above table Bartlett's test of significance is 0.00, which is less than 0.05 therefore, we reject H0. We conclude that variance of the variables differs significantly. So, here the overall inference is that the data is quite suitable for the application of technique of factor analysis.

The factor analysis run on the data extracts Six components whose eigen values are more than one and hence can be taken as the major factors. The cumulative explained variations by the six factors are 59.236% which is treated to be good. Individual variations by the factors are shown below.

TABLE:3

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.45	28.06	28.1	6.45	28.06	28.1	3.1	13.5	13.47
2	1.96	8.54	36.6	1.96	8.54	36.6	2.87	12.5	25.93
3	1.5	6.538	43.1	1.5	6.538	43.1	2.26	9.82	35.76
4	1.42	6.159	49.3	1.42	6.159	49.3	1.89	8.22	43.98
5	1.21	5.268	54.6	1.21	5.268	54.6	1.84	7.98	51.95
6	1.07	4.67	59.2	1.07	4.67	59.2	1.68	7.28	59.24
7	0.92	4.007	63.2						
8	0.88	3.803	67						
9	0.79	3.419	70.5						
10	0.77	3.347	73.8						
11	0.65	2.846	76.7						
12	0.65	2.804	79.5						
13	0.6	2.627	82.1						
14	0.55	2.386	84.5						
15	0.52	2.266	86.7						
16	0.48	2.081	88.8						
17	0.45	1.953	90.8						
18	0.43	1.872	92.6						
19	0.41	1.795	94.4						
20	0.4	1.721	96.2						
21	0.38	1.632	97.8						
22	0.27	1.19	99						
23	0.23	1.014	100						

Extraction Method: Principal Component Analysis.

We observe that the percentage of rotation sums squared loading variability explained by 1st component is 13.465%, by 2nd component is 12.468% and by 3rd component is 9.823% therefore among six components the first three components account for most of the total variability in data. The remaining components account for a very small proportion of the variability.

Eigen value is the indicator of the variance associated with the factors. The factor which has eigen value more than 1 has been taken as significant.

The perusal of the above table makes it clear, that in this study there are *six* components which have Eigen value more than 1 and as high as 6.454, 1.964, 1.504, 1.417, 1.212, 1.074 respectively. So, these six components are treated to be significant. In Extraction Sums of Squared Loadings, the first component accounts for 28.062 percent variations and the rest five accounts for 8.540 percent, 6.538 percent, 6.159 percent, 5.268 percent and 4.670 percent respectively. All the six factors jointly explain 59.236 percent of the variations which are sufficient enough to explain.

Table 5 explains the principal components without rotation. However the final results are to be seen after rotation which has been done by Varimax Rotation which means that each factor has a small number of large loadings and a large number of small loadings and each original variable tends to be associated with one (or a small number) of factors, and each factor represents only a small number of variables.

Table 3 and 5 highlights the exact result of the study. It minimizes the number of variables which have high loading on a factor and lead to good interpretation of factors.

TABLE:4

Component Matrix

	Component					
	1	2	3	4	5	6
Q.1.	.756					
Q.2.	.699					
Q.3.	.692					
Q.4	.664				-.402	
Q.5.	.663					
Q.6	.657					
Q.7	.639				.402	
Q.8	.639					
Q.9.	.622					
Q.10.	.621			-.449		
Q11.	.594					
Q.12.	.551			-.477		
Q.13.	.509		.401			
Q.14	.427					
Q.15.	.404					
Q.16.		.608				
Q.17.		.564				
Q.18.		.479		.407		
Q.19						
Q.20.		.416	.514			
Q.21.			.487			
Q.22.	.418		.439			.400
Q.23.				.404		

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

TABLE:5

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Q.1.	.783					
Q.2.	.772					
Q.3.	.665					
Q.4	.592					
Q.5.	.508					.448
Q.6		.814				
Q.7		.732				
Q.8		.670				
Q.9.		.579				
Q.10.			.709			
Q11.	.444		.599			
Q.12.			.586			
Q.13.			.565			
Q.14			.475			
Q.15.				.691		
Q.16.				.635		
Q.17.				.619		
Q.18.					.753	
Q.19					.699	
Q.20.					.567	
Q.21.					.530	.512
Q.22.						.679
Q.23.		.477				.595

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

From the rotated component matrix, we have considered only those components for interpretation whose values are greater than 0.6.

TABLE:6

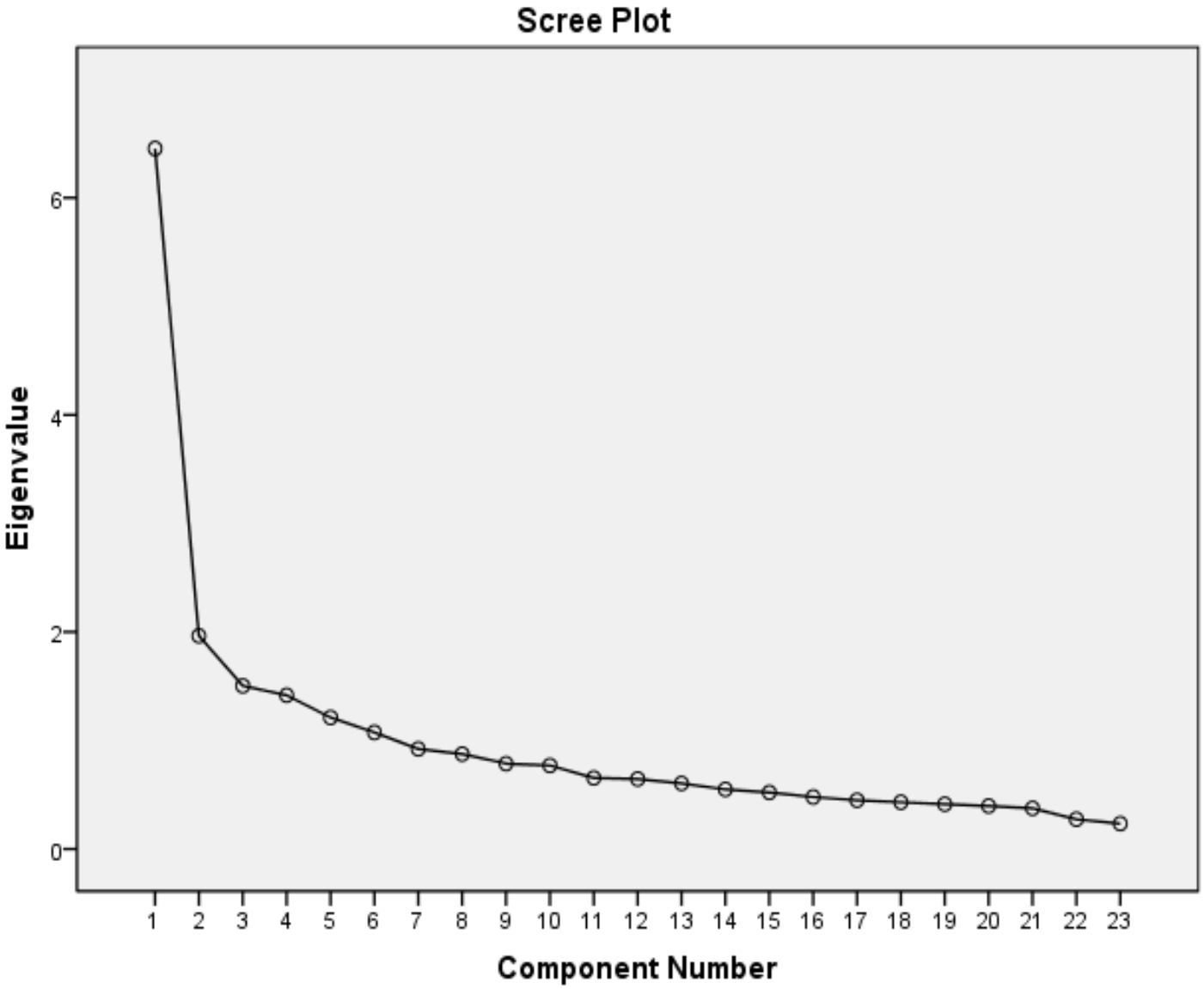
Communalities

	Initial	Extraction
Q.1.	1.000	.564
Q.2.	1.000	.468
Q.3.	1.000	.626
Q.4	1.000	.538
Q.5.	1.000	.692
Q.6	1.000	.664
Q.7	1.000	.543
Q.8	1.000	.461
Q.9.	1.000	.536
Q.10.	1.000	.679
Q11.	1.000	.603
Q.12.	1.000	.595
Q.13.	1.000	.366
Q.14	1.000	.624
Q.15.	1.000	.696
Q.16.	1.000	.732
Q.17.	1.000	.500
Q.18.	1.000	.608
Q.19	1.000	.696
Q.20.	1.000	.667
Q.21.	1.000	.637
Q.22.	1.000	.615
Q.23.	1.000	.515

Extraction Method: Principal Component Analysis.

The communalities show the amount of variance the variables share with each other. They are the proportion of variance explained by common factors. The size of communality is the index for assessing how much variance in a particular variable is accounted for by the factor solution. Large size of communalities indicates that a large amount of variance in a variable has been extracted by the factor solution. Communalities are considered high if they have Extraction value more than 0.40 and close to 0.70.

Interpretation of Scree Plot:



These result shows that rotated factor loadings for all the factors are used by principal component method of extraction. In above Scree plot, there are 6 components which are having greater than 1 eigen value.

TABLE:7

Component Transformation Matrix

Component	1	2	3	4	5	6
1	.587	.557	.375	.317	.114	.303
2	.117	.192	-.463	-.349	.780	.066
3	-.034	-.362	.716	-.057	.518	-.290
4	-.611	.024	-.018	.593	.304	.427
5	-.472	.499	.356	-.585	-.121	.211
6	.214	-.521	.074	-.284	-.052	.770

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

The whole set of variables can be summed up into six main factors i.e. F-1, F-2, F-3, F-4, F5 and F6 which are sufficient enough to explain the cumulative variations to the tune of 59.236 percent which is reasonably significant. The six factors which come out to be most significant to the study of working people of career satisfaction are explained as follows.

Factor 1: Career Goals

This is the most significant factor which explains 28.062 % of the total variations. Five variables are loaded on this factor and the variables are loaded which value more than 0.4. Career satisfaction study with common and working variables extracted are advancement goals, income goals, overall goals, meeting the challenging task at work and satisfied with the income based on work are the variables loaded on this factor with value 0.783, 0.772, 0.665, 0.592, 0.508 respectively.

Factor 2: Growth and Advancement at work

The second factor is comprised of variables that allowance skills and abilities at work place, growth and advancement opportunity based on work, satisfied with the work and location

matters for my career growth. They are loaded on this factor with value as high as 0.814, 0.732, 0.670 and 0.579 respectively. This factor here explains 8.546% of the variations.

Factor 3: Technical, conceptual and Interpersonal skills

The 3rd factor explains about technical, conceptual skills and other skills**.** Variable of abilities of technical /conceptual skills, other skills achieved along with their career, personality match for career, satisfied with curriculum for present career and family supports during ups and downs in career are correlated. They are loaded on this factor with value as high as 0.709, 0.599, 0.586, 0.565 and 0.475 respectively. This 3rd factor explains 6.538% of the variations.

Factor 4: Confidence in his/her field

The factor here explains 0.691, 0.635 and 0.619 of the variations. Variables based on candidate's current career never lead to unemployment explained by a value of 0.691. Satisfaction with status having in society due to the career variable is explained by a value of 0.635. Contented with the career even if don't get job variable is explained by a value of 0.619. Together they explain 6.159 % of the variations.

Factor 5: Loyalty

The factor here explains 0.753, 0.699, 0.567 and 0.530 of the variations. The variable which are related with person would like to change my current career if he/she find better opportunities elsewhere is explained by a value of 0.753. While person can work in a domain different from his/her educational background, currently working in a domain different from educational background and would like to change current job if person find better opportunities elsewhere are the few variables that explained with loadings of 0.699, 0.567 and 0.530 respectively. Together the loadings explain 5.268% of the variations.

Factor 6: Work life balance.

The factor here explains 4.670% of the total variations. The variable such as maintain a balance between work and personal life and happy to spent time at work are variables correlated together and are explained with loadings of 0.679 and 0.595 respectively.

Z – TEST

A z-test is a statistical test to determine whether two population means are different when the variances are known, and the sample size is large. It can be used to test hypotheses in which the z-test follows a normal distribution. A z-statistic, or z-score, is a number representing the result from the z-test. Z-tests are closely related to t-tests, but t-tests are best performed when an experiment has a small sample size. Also, t-tests assume the standard deviation is unknown, while z-tests assume it is known. When conducting a z-test, the null and alternative hypotheses, alpha and z-score should be stated. Next, the test statistic should be calculated, and the results and conclusion stated.

Here depending on the data, we would perform two- tailed z- test for two sample means.

P(Z <= z) two tail should be interpreted as P(Z>= | z |) or Z <= - | z |)) or the probability of a z Critical two-tail value larger than the absolute value of the observed z value, where there is no difference between the two population means.

Keeping the alpha value equal to 0.05 and observed z value is 1.95996 and conducting the test in python using user define function.

Hypotheses:

H0: The mean career satisfaction of one variable = mean career satisfaction of the other variable

VS

H1: The mean career satisfaction of one variable ≠ mean career satisfaction of the other variable.

Test Statistic:

The general formula for Z – Score is

$$z = \frac{\bar{x}_1 - \bar{x}_2 - \Delta}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

where $\bar{x}_1$ and $\bar{x}_2$ are the means of the two samples, Δ is the hypothesized difference between the population means (0 if testing for equal means), σ_1 and σ_2 are the standard deviations of the two populations, and n_1 and n_2 are the sizes of the two samples.

The code for the test is:

```
def twosampz(X1,X2, mudiff, sd1, sd2, n1,n2):
    from numpy import sqrt, abs, round
    from scipy.stats import norm
    pooledSE = sqrt(sd1**2/n1 + sd2**2/n2)
    z = ((X1 - X2) - mudiff)/pooledSE
    pval = 2*(1 - norm.cdf(abs(z)))
    return round(z,3), round(pval,5)
```

For Working

- **Z – test for Comparative study of career satisfaction of working and non-working people.**

1) Objective: Comparison of mean career satisfaction between male and female

To Test:

H0: The mean career satisfaction for males in working category is same as female

Vs

H1: The mean career satisfaction for males in working category is not same as female

Code:

```
z , p = twosampz(3.715,3.560,0,0.338,0.319,193,82)
print(z, p)
```

Output:

Z = 2.049

P = 0.04041

Observation: since |Z| >= to Z Critical (1.95) also p-value <= alpha (0.05), we have enough evidence to reject the null hypothesis.

Conclusion: Hence we conclude that mean career satisfaction among male and female is not same.

2) Objective: Comparison of mean career satisfaction between occupations that is self-employed and job.

To Test:

H0: The mean career satisfaction for one's self employed in working category is same as people doing job

Vs

H1: The mean career satisfaction for one's self employed in working category is not same as people doing job

Code:

```
z , p = twosampz(3.895,3.633,0,0.176,0.355,48,243)
print(z, p)
```

Output:

Z = 3.654

P = 0.00025

Observation: since |Z| >= to Z Critical (1.95) also p-value <= alpha(0.05), we have enough evidence to reject the null hypothesis.

Conclusion: We can conclude based on the above results that mean career satisfaction of respondents who are self-employed and those who doing job is significantly different.

3) Objective: Comparison career satisfaction amongst various disciplines. (Professional and Non-professional)

To Test:

H0: The mean career satisfaction among Professional course and Non-professional course students is equal.

Vs

H1: The mean career satisfaction among Professional course and Non-professional course students is not equal.

Code:

```
z, p = twosampz(3.640,3.681,0,0.340,0.336,89,185)
print (z, p)
```

Output:

Z = -0.541

P = 0.58848

Observation: since |Z| <= to Z Critical (1.95) also p-value >= alpha (0.05), we do not have enough evidence to reject the null hypothesis.

Conclusion: Based on the above results it can be concluded that mean career satisfaction among engineering and science students is equal

4) Objective: Comparison of mean career satisfaction between the type of work (Field work and Office work)

To Test:

H0: The mean career satisfaction among respondents engaged in field work is same as those in office work

Vs

H1: The mean career satisfaction among respondents engaged in field work is not equal to those in office work.

Code:

```
z, p = twosampz(3.680,3.662,0,0.344,0.333,94,181)
print (z, p)
```

Output:

Z = 0.240

P = 0.80986

Observation: since |Z| <= to Z Critical (1.95) also p-value >= alpha (0.05), we do not have enough evidence to reject the null hypothesis.

Conclusion: we can conclude that the mean career satisfaction of respondents engaged in field work and office work is same.

For Non-Working

5) Objective: Comparison of mean career satisfaction between male and female

To Test:

H0: The mean career satisfaction of male is equal to female

Vs

H1: The mean career satisfaction of male is not equal to female

Code:

```
z, p = twosampz(3.488,3.431,0,0.431,0.466,44,45)
print (z, p)
```

Output:

Z = 0.393

P = 0.69373

Observation: since |Z| <= to Z Critical (1.95) also p-value >= alpha (0.05), we do not have enough evidence to reject the null hypothesis.

Conclusion: we conclude that there is no significant difference between mean career satisfaction of male and female.

6) Objective: Comparison career satisfaction amongst various disciplines. (Professional and Non-professional)

To Test:

H0: The mean career satisfaction among Professional course and Non-professional course students is equal.

Vs

H1: The mean career satisfaction among Professional course and Non-professional course students is not equal.

Code:

```
z, p = twosampz(3.181,3.553,0,0.491,0.399,22,65)
print (z, p)
```

Output:

Z = -2.204

P = 0.02750

Observation: since |Z| >= to Z Critical (1.95) also p-value <= alpha (0.05), we have enough evidence to reject the null hypothesis.

Conclusion: we conclude that mean career satisfaction of respondents having pursued science or engineering is significantly different.

7) Objective: Comparison of mean career satisfaction between working and non-working respondents.

To Test:

H0: The mean career satisfaction among working respondents and non-working is equal.

Vs

H1: The mean career satisfaction among working respondents and non-working is not equal.

Code:

```
z, p = twosampz(3.669,3.449,0,0.337,0.449,275,89)
print (z, p)
```

Output:

Z = 2.771

P = 0.00557

Observation: since |Z| >= to Z Critical (1.95) also p-value <= alpha (0.05), we have enough evidence to reject the null hypothesis.

Conclusion: Hence we conclude that mean career satisfaction among working and non-working is not same.

CHI-SQUARE TEST FOR INDEPENDENCE OF ATTRIBUTE

In statistics, ***G*-tests** are likelihood-ratio or maximum likelihood statistical significance tests that are increasingly being used in situations where assumption of chi-squared tests are breaks down if expected frequencies are too low. At least 80% of expected frequencies should be five or more than 5 and for r*c table where r is the numbers of rows and c is the numbers of columns. *G*-tests have been recommended at least since the 1981 edition of *Biometry*, a statistics textbook by Robert R. Sokal and F. James Rolf. The *G*–test of independence is an alternative to the chi-square test of independence and they will give approximately the same results. When the expected frequencies do not meet the 20% threshold, alternate tests like the Fisher's exact test for 2*2 tables and for r*c tables we used G-statistics/likelihood ratio. In our analysis more than 20% of expected frequencies are less than 5 therefore, we used G-test in our study.

Hypotheses:

Ho: The relative proportions of one variable are independent of the second variable

against

H1: The relative proportions of one variable are not independent of the second variable

Test statistic:

The general formula for *G* is

$$\boldsymbol{G = 2\sum_i O_i . \ln(\frac{O_i}{E_i})}$$

Where, $O_i \geq 0$ is the observed count in a cell, $E_i > 0$ is the expected count under the null hypothesis, denotes the natural logarithm, and the sum is taken over all non-empty cells. Furthermore, the total observed count should be equal to the total expected count:

$$O_i = E_i = N$$

Where N is the total numbers of observations.

Cramer's V:

In statistics, Cramer's V is a measure of association between more than two nominal variables, giving a value between 0 and +1. Close to 0 it shows little association between variables. Close to 1, it indicates a strong association. It is used as post-test to determine strengths of association after chi-square has determined significance. It is based on Pearson's chi-squared statistic and was published by Harald Cramer in 1946. the usual way to estimate Cramer's v value from the data is via the formula

$$\text{Cramer's V} = \sqrt{\frac{\chi^2}{n \cdot \min(r-1, c-1)}}$$

Where, χ^2 = chi-square value, n = sample size, r = the number of rows, c = the number of columns. The expression "min (r-1, c-1)" means that the number of rows and columns is reduced by 1.

CROSS TABULATION

The Crosstabs procedure forms two-way and multiway tables and provides a variety of tests and measures the association for two ways tables. The structure of the table and categories determine what test or measure to use. Cross tabs statistics and measures of association are computed for two-way tables only. If you specify a row, a column and layer factor (control variable), the cross tabs procedure forms one panel of associated statistics and measures for each value of the layer factor (or a of values combination for two or more control variables).

Some useful packages of python:

```
import pandas as pd
import numpy as np
import researchpy as rp
```

- **G-test for working people on different attributes like gender, years of experience, marital status, percentage/CGPA in the last degree of their educational background, satisfaction on decision of choosing science stream.**

1) Objective: To check the dependency of career satisfaction of working people on Gender.

To Test:

Ho: career satisfaction of working people is independent of gender**.**

Vs

H1: career satisfaction of working people is not independent of gender.

Python code:

```
data=pd.read_excel(r'C:\Users\HOME\Downloads\FULL FINAL DATA- CS.xlsx','working')
data.head()
crosstab,res,expected=rp.crosstab(data['gender'],data['round_mean'],test="g-
test",expected_freqs=True)
print(crosstab)
print(res)
print(expected)
```

OUTPUT:

```
round_mean
            2   3    4  5  All
gender
1            7  47  133  6  193
2            1  36   43  2   82
All          8  83  176  8  275

G-test  results
0  Log-likelihood ratio ( 3.0) =   10.7835
1                 p-value =    0.0130
2               Cramer's V =    0.1980
      round_mean
            2         3      4         5
gender
1       5.614545  58.250909  123.52  5.614545
2       2.385455  24.749091   52.48  2.385455
```

Here alpha = 0.05

P-value = 0.0130

Conclusion:

As p-value < alpha, therefore the data provide enough evident to reject H0 at 5% l.o.s. Hence, we conclude that career satisfaction of working people is not independent of gender. As there is association between two attributes, i.e. gender and career satisfaction of working people. Then how much?

Hence fore we refer Cramer's v value. Thus, there is 19.80% association between gender and career satisfaction of working people.

2) Objective: To check the dependency of career satisfaction of working people on Years of experience.

To Test:

Ho: career satisfaction of working people is independent of years of experience**.**

Vs

H1: career satisfaction of working people is not independent of years of experience.

Python code:

```
crosstab1,res1,expected1=rp.crosstab(data['years of experience'],data['round_mean'],test="g-test",expected_freqs=True)
print(crosstab1)
print(res1)
print(expected1)
```

OUTPUT:

round_mean

	2	3	4	5	All
years of experience					
1	3	6	24	1	34
2	0	13	33	1	47
3	1	9	21	1	32
4	2	23	43	3	71
5	2	32	55	2	91
All	8	83	176	8	275

G-test results

0	Log-likelihood ratio (12.0) = 10.0903
1	p-value = 0.6080
2	Cramer's V = 0.1106

	round_mean			
	2	3	4	5
years of experience				
1	0.989091	10.261818	21.76	0.989091
2	1.367273	14.185455	30.08	1.367273
3	0.930909	9.658182	20.48	0.930909
4	2.065455	21.429091	45.44	2.065455
5	2.647273	27.465455	58.24	2.647273

Here alpha = 0.05

P-value = 0.6080

Conclusion:

As p-value>alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. H ence we conclude that career satisfaction of working people is independent of years of experie nce. As there is no association between two attributes, i.e. years of experience and career satis faction of working people

3) Objective: To check the dependency of career satisfaction of working people on percentage/CGPA in the last degree of their educational background.

To Test:

Ho: career satisfaction of working people is independent of percentage/CGPA in the last degree of their educational background.

Vs

H1: career satisfaction of working people is not independent of percentage/CGPA in the last degree of their educational background.

Python code:

```
crosstab2,res2,expected2=rp.crosstab(data['grades'],data['round_mean'],test="g-
test",expected_freqs=True)
print(crosstab2)
print(res2)
print(expected2)
```

OUTPUT:

round_mean

	2	3	4	5	All
grades					
1	0	0	2	0	2
2	3	19	38	0	60
3	2	33	76	4	115
4	3	25	51	3	82
5	0	6	7	1	14
6	0	0	2	0	2
All	8	83	176	8	275

G-test results

0 Log-likelihood ratio (15.0) = 11.6508

1 p-value = 0.7052

2 Cramer's V = 0.1188

round_mean

	2	3	4	5
grades				
1	0.058182	0.603636	1.28	0.058182
2	1.745455	18.109091	38.40	1.745455
3	3.345455	34.709091	73.60	3.345455
4	2.385455	24.749091	52.48	2.385455
5	0.407273	4.225455	8.96	0.407273
6	0.058182	0.603636	1.28	0.058182

Here alpha = 0.05

P-value = 0.7052

Conclusion:

As p-value>alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. Hence, we conclude that career satisfaction of working people is independent of percentage/CGPA in the last degree of their educational background. As there is no association between two attributes, i.e. percentage/CGPA in the last degree of their educational background and career satisfaction of working people.

4) Objective: To check the dependency of career satisfaction of working people on marital status.

To Test:

Ho: career satisfaction of working people is independent of marital status.

Vs

H1: career satisfaction of working people is not independent of marital status.

Python code:

```
crosstab3,res3,expected3=rp.crosstab(data['maritalstatus'],data['round_mean'],test="g-test",expected_freqs=True)
print(crosstab3)
print(res3)
print(expected3)
```

OUTPUT:

round_mean

	2	3	4	5	All
marital status					
1	4	22	45	3	74
2	4	61	129	5	199
3	0	0	1	0	1
4	0	0	1	0	1
All	8	83	176	8	275

G-test results

0 Log-likelihood ratio (9.0) = 4.2376

1 p-value = 0.8951

2 Cramer's V = 0.0717

round_mean

	2	3	4	5
marital status				
1	2.152727	22.334545	47.36	2.152727
2	5.789091	60.061818	127.36	5.789091

3	0.029091	0.301818	0.64	0.029091
4	0.029091	0.301818	0.64	0.029091

Here alpha = 0.05

P-value = 0.8951

Conclusion:

As p-value>alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. Hence, we conclude that career satisfaction of working people is independent of marital status. As there is no association between two attributes, i.e. marital status and career satisfaction of working people.

5) Objective: To check the dependency of career satisfaction of working people having decided to choose science stream as a career.

To Test:

Ho: career satisfaction of working people is independent from their decision of choosing science stream as a career.

Vs

H1: career satisfaction of working people is independent from their decision of choosing science stream as a career.

Python code:

```
crosstab4,res4,expected4=rp.crosstab(data['decision'],data['round_mean'],test="g-
test",expected_freqs=True)
print(crosstab4)
print(res4)
print(expected4)
```

OUTPUT:

```
round_mean
              2   3    4  5  All
decision
1              1   5    5  1   12
```

2	1	2	3	1	7
3	0	9	18	0	27
4	1	34	61	0	96
5	5	33	89	6	133
All	8	83	176	8	275

G-test results

0 Log-likelihood ratio (12.0) = 20.9185

1 p-value = 0.0516

2 Cramer's V = 0.1592

round_mean	2	3	4	5
decision				
1	0.349091	3.621818	7.68	0.349091
2	0.203636	2.112727	4.48	0.203636
3	0.785455	8.149091	17.28	0.785455
4	2.792727	28.974545	61.44	2.792727
5	3.869091	40.141818	85.12	3.869091

Here alpha = 0.05

P-value = 0.0516

Conclusion:

As p-value > alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. Hence we conclude that career satisfaction of working people is independent of satisfaction on decision of choosing science stream. As there is association between two attributes, i.e. satisfaction on decision of choosing science stream and career satisfaction of working people.Then how much?

Hence fore we refer cramer's v value. Thus there is 16.98% association between satisfaction on decision of choosing science stream and career satisfaction of working people

- **G-test for non-working people on different attributes like gender, marital status, percentage/CGPA in the last degree of their educational background.**

1) **Objective: To check the dependency of career satisfaction of non-working people on Gender.**

To Test:

Ho: career satisfaction of non-working people is independent of gender**.**

Vs

H1: career satisfaction of non-working people is not independent of gender.

Python code:

```
data1=pd.read_excel(r'C:\Users\HOME\Downloads\FULL FINAL DATA- CS.xlsx','non-working')
data1.head()
crosstab5,res5,expected5=rp.crosstab(data1['gender'],data1['round_mean'],test="g-test",expected_freqs=True)
print(crosstab5)
print(res5)
print(expected5)
```

OUTPUT:

```
round_mean
              2   3   4  5 All
gender
1             2  21  19  2  44
2             4  19  21  1  45
All           6  40  40  3  89
                     G-test  results
0  Log-likelihood ratio ( 3.0) =    1.2082
1                 p-value =    0.7510
2               Cramer's V =    0.1165
      round_mean
              2         3         4         5
gender
1       2.966292  19.775281  19.775281  1.483146
2       3.033708  20.224719  20.224719  1.516854
```

Here alpha = 0.05

P-value = 0.7510

Conclusion:

As p-value>alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. Hence we conclude that career satisfaction of non-working people is independent of gender. As there is no association between two attributes, i.e. gender and career satisfaction of non-working people.

2) Objective: To check the dependency of career satisfaction of non-working people on marital status.

To Test:

Ho: career satisfaction of non-working people is independent of marital status.

Vs

H1: career satisfaction of non-working people is not independent of marital status.

Python code:

```
crosstab6,res6,expected6=rp.crosstab(data1['marital status'],data1['round_mean'],test="g-test",expected_freqs=True)
print(crosstab6)
print(res6)
print(expected6)
```

OUTPUT:

```
round_mean
                2   3   4  5 All
marital status
1               0   6  14  1  21
2               6  34  26  2  68
All             6  40  40  3  89
                 G-test  results
0  Log-likelihood ratio ( 3.0) =    7.8227
1               p-value =    0.0498
```

2 Cramer's V = 0.2965

round_mean

2 3 4 5

marital status

1 1.41573 9.438202 9.438202 0.707865

2 4.58427 30.561798 30.561798 2.292135

Here alpha = 0.05

P-value = 0.0498

Conclusion:

As p-value<alpha, therefore the data provide enough evident to reject H0 at 5% l.o.s. Hence we conclude that career satisfaction of non-working people is dependent of marital status. As there is association between two attributes, i.e. marital status and career satisfaction of non-working people.

Hence fore we refer cramer's v value. Thus, there is 29.65% association between marital status and career satisfaction of non-working people.

3) Objective: To check the dependency of career satisfaction of non-working people on percentage/CGPA in the last degree of their educational background.

To Test:

Ho: career satisfaction of non-working people is independent of percentage/CGPA in the last degree of their educational background.

Vs

H1: career satisfaction of non-working people is not independent of percentage/CGPA in the last degree of their educational background.

Python code:

```
crosstab11,res11,expected11=rp.crosstab(data3['grades'],data3['round_mean'],test="g-test",expected_freqs=True)
print(crosstab11)
print(res11)
print(expected11)
```

OUTPUT:

round_mean

	2	3	4	5	All
grades					
1	0	1	3	0	4
2	3	26	54	0	83
3	4	48	88	6	146
4	6	36	60	4	106
5	1	11	9	1	22
6	0	1	2	0	3
All	14	123	216	11	364

G-test results

0 Log-likelihood ratio (15.0) = 12.1406

1 p-value = 0.6684

2 Cramer's V = 0.1054

round_mean

	2	3	4	5
grades				
1	0.153846	1.351648	2.373626	0.120879
2	3.192308	28.046703	49.252747	2.508242
3	5.615385	49.335165	86.637363	4.412088
4	4.076923	35.818681	62.901099	3.203297
5	0.846154	7.434066	13.054945	0.664835
6	0.115385	1.013736	1.780220	0.090659

Here alpha = 0.05

P-value = 0.6684

Conclusion:

As p-value>alpha, therefore the data provide enough evident to do not reject H0 at 5% l.o.s. Hence we conclude that career satisfaction of non-working people is independent of percentage/CGPA in the last degree of their educational background. As there is no association between two attributes, i.e. percentage/CGPA in the last degree of their educational background and career satisfaction of non-working people.

ONE-WAY ANOVA

In statistics the One-way Analysis of Variance (ANOVA) is a procedure for testing the hypothesis that K population means are equal, where K > 2. The One-way ANOVA compares the means of the samples or groups in order to make inferences about the population means. The One-way ANOVA is also called a single factor analysis of variance because there is only one independent variable or factor. The independent variable has nominal levels or a few ordered levels.

In an ANOVA, there are two kinds of variables: independent and dependent. The independent variable is controlled or manipulated by the researcher. It is a categorical (discrete) variable used to form the groupings of observations. In our study career satisfaction score is dependent variable and the independent variables represented the three different types of occupations: 1) business, 2) Government and 3) private.

HYPOTHESES FOR THE ONE-WAY ANOVA

The null hypothesis (H0) tested in the One-way ANOVA is that the population means

from which the K samples are selected are equal. Or that each of the group means is equal.

In our study we are determining that whether the mean of career satisfaction score for working people in government, private and business sectors are same or not?

H0: $\mu_1 = \mu_2 = \mu_3$

Where

- μ_1 is population mean score of career satisfaction of people those who are working in business sector.
- μ_2 is population mean score of career satisfaction of people those who are working in government sector.
- μ_3 is population mean score of career satisfaction of people those who are working in private sector.

The alternative hypothesis (H1) is that at least one group mean significantly differs from

the other group means.

ASSUMPTIONS UNDERLYING THE ONE-WAY ANOVA

1). Assumption of independence: The observations are random and independent samples from the populations. In our study all the observations are randomly collected and they are independent also.

2) Assumption of normality: In our study we have more than 30 observations therefore we assumed that our data is normally distributed.

3) Assumption of homogeneity of variance***:*** The variances on the dependent variable

are equal across the groups.

In statistics, Levene's test is an inferential statistic used to assess the equality of variances for a variable calculated for two or more groups. Some common statistical procedures assume that variances of the populations from which different samples are drawn are equal. Levene's test assesses this assumption. It tests the null hypothesis that the population variances are equal (called homogeneity of variance or homoscedasticity). If the resulting *p*-value of Levene's test is less than some significance level (typically 0.05), the obtained differences in sample variances are unlikely to have occurred based on random sampling from a population with equal variances. Thus, the null hypothesis of equal variances is rejected and it is concluded that there is a difference between the variances in the population.

The Levene test is define as: Null Hypothesis: H0: $\sigma_1^2 = \sigma_2^2 = \ldots = \sigma_k^2$

Alternative Hypothesis: H1: $\sigma_i^2 \neq \sigma_k^2$ for some i and k

Test statistics: Give a variable Y with sample of size N divided into K subgroups, where N_i is the sample size of the i^{th} subgroups, the Levene test statistics is defined as:

$$W = \frac{(N-k)}{(k-1)} \cdot \frac{\sum_{i=1}^{k} N_i (Z_{i\cdot} - Z_{\cdot\cdot})^2}{\sum_{i=1}^{k} \sum_{j=1}^{N_i} (Z_{ij} - Z_{i\cdot})^2},$$

where

- k is the number of different groups to which the sampled cases belong,
- N_i is the number of cases in the i^{th} group,
- N is the total number of cases in all groups,
- Y_{ij} is the value of the measured variable for the j^{th} case from the i^{th} group,

- $Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_{i\cdot}|, & \bar{Y}_{i\cdot} \text{ is a mean of the } i\text{-th group}, \\ |Y_{ij} - \tilde{Y}_{i\cdot}|, & \tilde{Y}_{i\cdot} \text{ is a median of the } i\text{-th group}. \end{cases}$

- $Z_{i\cdot} = \frac{1}{N_i}\sum_{j=1}^{N_i} Z_{ij}$ is the mean of the Z_{ij} for group i,
- $Z_{\cdot\cdot} = \frac{1}{N}\sum_{i=1}^{k}\sum_{j=1}^{N_i} Z_{ij}$ is the mean of all Z_{ij}.

The test statistic W is approximately F-distributed with k-1 and N-k degrees of freedom, and hence is the significance of the outcome of W tested against F(α,k-1,N-k) where F is a quantile of the F-distribution, with k-1 and N-k degrees of freedom, and α is the chosen level of significance (usually 0.05 or 0.01).

Test of Homogeneity of Variances

career satisfaction score

Levene Statistic	df1	df2	Sig.
1.158	2	272	.316

In the above table it is performed the Levene's Test of Homogeneity of Variances, *F* (2, 272) =1.158, *p* = .316 With an alpha level of .05, here, *p* (.316) > a (.05), we do not reject H0 at 0.05 % level of significance. That means variance of all three groups are same. Assumptions of homogeneity of variance is full fill. All assumptions of one -way ANOVA is full fill. Therefor we use one-way ANOVA to compare mean of career satisfaction score for working people in government, private and business sectors.

SUMMARY TABLE FOR THE ONE-WAY ANOVA

Source of Variation	**Sums of Squares (SS)**	**Degrees of Freedom (df)**	**Mean Squares (MS)**	**F**
Between Treatments	$\mathbf{SSB} = \Sigma n_j \left(\bar{X}_j - \bar{X}\right)^2$	k-1	$\mathbf{MSB} = \frac{SSB}{k-1}$	$F = \frac{\mathrm{MSB}}{\mathrm{MSE}}$
Error (or Residual)	$\mathbf{SSE} = \Sigma\Sigma \left(X - \bar{X}_j\right)^2$	N-k	$\mathbf{MSE} = \frac{\mathrm{MSE}}{N-k}$	
Total	$\mathbf{SST} = \Sigma\Sigma \left(X - \bar{X}\right)^2$	N-1		

where

- X = individual observation,
- X_j= sample mean of the j^{th} treatment (or group),
- $\bar{X}$ = overall sample mean,
- k = the number of treatments or independent comparison groups and
- N = total number of observations or total sample size.

- The first column is entitled "Source of Variation" and delineates the between groups and error or residual variation. The total variation is the sum of the between groups and error variation.
- The second column is entitled "Sums of Squares (SS)". The between group sums of squares is

$$\mathbf{SSB} = \Sigma n_j \left(\bar{X}_j - \bar{X}\right)^2$$

and is computed by summing the squared differences between each group mean and the overall mean. The squared differences are weighted by the sample sizes per group (n_j). The error sums of squares are:

$$\mathrm{SSE} = \Sigma\Sigma\left(X - \bar{X}_j\right)^2$$

and is computed by summing the squared differences between each observation and its group mean (i.e., the squared differences between each observation in group 1 and the group 1 mean, the squared differences between each observation in group 2 and the group 2 mean, and so on). The double summation (SS) indicates summation of the squared differences within each treatment and then summation of these totals across treatments to produce a single value. (This will be illustrated in the following examples). The total sums of squares are:

$$\mathrm{SST} = \Sigma\Sigma\left(X - \bar{X}\right)^2$$

and is computed by summing the squared differences between each observation and the overall sample mean. In an ANOVA, data are organized by comparison groups. If all of the data were pooled into a single sample, SST would reflect the numerator of the sample variance computed on the pooled or total sample. SST does not figure into the F statistic directly. However, SST = SSB + SSE, thus if two sums of squares are known, the third can be computed from the other two.

- The third column contains degrees of freedom. The between treatment degrees of freedom is df_1 = k-1. The error degrees of freedom are df_2 = N - k. The total degrees of freedom are N-1 (and it is also true that (k-1) + (N-k) = N-1).
- The fourth column contains "Mean Squares (MS)" which are computed by dividing sums of squares (SS) by degrees of freedom (df), row by row. Specifically, MSB=SSB/(k-1) and MSE=SSE/(N-k). Dividing SST/(N-1) produces the variance of the total sample. The F statistic is in the rightmost column of the ANOVA table and is computed by taking the ratio of MSB/MSE.

ANOVA

career satisfaction score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.054	2	1.027	4.062	.018
Within Groups	68.774	272	.253		
Total	70.828	274			

F (2, 272) =4.062, *p* = 0.018 With an alpha level of .05, here, *p* (0.018) < a (.05), we reject H0 at 0.05 % level of significance. There is significance difference between mean score of career satisfaction of at least one group. That means levels of career satisfaction between people that are working in government, private and business sectors are difference.

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APPENDIX

Questionnaire:

Section -1

Demographic:

1. Age:
   a. Below 23 b. 23-25 c. 26 – 28 d. above 28

2. Gender:
   a. Male b. Female
3. Percentage /CGPA in last Degree

   _____
4. Educational background:
   a. Bachelors in _____
   b. Masters in _____
   c. Other Courses _____

5. Year of passing the last education
   a. 2014 b. 2015 c. 2016 d 2017 e. 2018

6. Marital Status
   a. Married b. unmarried c. divorcee d. Widowed
   If married, Spouse's Occupation _____

Scale: Strongly Agree, Agree, neutral, disagree, and strongly disagree

Sr. No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7	I think my curriculum was sufficient for my present career.	◯	◯	◯	◯	◯
8	My personality is a perfect match with my career.	◯	◯	◯	◯	◯

9	I am satisfied with the skills I have achieved along with my career.	◯	◯	◯	◯	◯
10	I am able to apply my conceptual/technical skills in my career journey.	◯	◯	◯	◯	◯
11	I am satisfied with the progress I have made toward meeting my goals for income.	◯	◯	◯	◯	◯
12	I am satisfied with the progress I have made toward meeting my goals for career advancement.	◯	◯	◯	◯	◯
13	I am satisfied with the progress I have made toward meeting the challenging task at my work.	◯	◯	◯	◯	◯
14	I am contented with my career even if I don't get job.	◯	◯	◯	◯	◯
15	I can work in a domain different from my educational background.	◯	◯	◯	◯	◯
16	I would like to change my current career if I find better opportunities elsewhere.	◯	◯	◯	◯	◯
17	Based on my career I can never remain unemployed.	◯	◯	◯	◯	◯
18	I'm satisfied with the status I have in society due to my career.	◯	◯	◯	◯	◯
19	My family supports me during ups and downs in my career.	◯	◯	◯	◯	◯
20	I am satisfied with the progress I have made toward meeting my overall career goals.	◯	◯	◯	◯	◯

21. I need or had to acquire few more skills through additional courses for betterment of my career.

a. Yes b. No

If yes, Specify _____

22. I think I can have better performance in my career if had exposure to

a. Soft skills b. Technical/programming Skills

c. Interactive session d. practical applications

e. specifies other (if any) _____

23. I will continue with my present career.

a. If yes Reason _____

b. If no Reason _____

24. Number of dependents in family

a. 1 b.2 c. 3 d. more than 3 e. No one.

25. I'm currently

a. Working

b. Not working

Part (A)

(For Working people)

1. Occupation

a. self-employed b. Job

2. Designation: _____ (P.S. specify your position)
3. Company/organization/institute Sector

a. Government b. Private c. Business

4. Current working domain _____
5. Years of work Experience

   a. 1 b. 2 c. 3 D. 4 e.5
6. How many times have you switched your Job / Business?

   a. 0 b. 1 c. 2 D. more than 3
7. No of interviews faced.

   a. 1-2 b. 3-4 c. 5-6 d. more
8. I am working in a domain different from my educational background.

   a. Yes b. No

(Scale: Strongly Agree, Agree, neutral, disagree, and strongly disagree.)

Sr. No.	**Questions**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
9	I'm satisfied with the work I do.	◯	◯	◯	◯	◯
10	My work allows me to use a variety of skills and abilities.	◯	◯	◯	◯	◯
11	My location is appropriate for my career growth.	◯	◯	◯	◯	◯
11	I'm satisfied with the income based on my work.	◯	◯	◯	◯	◯
12	I 'm happy with the amount of time spent at work.	◯	◯	◯	◯	◯
14	I have growth and advancement opportunity based on my work.	◯	◯	◯	◯	◯
15	I'm able to maintain balance between work and personal life.	◯	◯	◯	◯	◯
16	I would like to change my current job if I find better opportunities elsewhere.	◯	◯	◯	◯	◯

Part (B)

(For Not working people)

(Scale: Strongly Agree, Agree, neutral, disagree, and strongly disagree.)

Sr. No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	As of now I am occupied in my personal engagements.	◯	◯	◯	◯	◯
2	I'm currently busy in doing further study.	◯	◯	◯	◯	◯
3	My focus is on government exams at present.	◯	◯	◯	◯	◯
4	I am not really looking for a job.	◯	◯	◯	◯	◯
5	I have done job before and may look for one in near future.	◯	◯	◯	◯	◯
6	I am not happy with available job opportunities and salary offered.	◯	◯	◯	◯	◯
7	There is very less opportunity based on my educational background.	◯	◯	◯	◯	◯
8	I am waiting for the desired job.	◯	◯	◯	◯	◯

Section -2

2) 10^{th} Result

	Marks
Science	
Mathematics	
Overall %	

3) Science stream and subjects liking related Questions:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am happy with my decision of choosing science.					
I like to study Physics					
I like to study Mathematics					
I like to study Chemistry					
I chose science stream as it has increased my opportunities of choosing the career of my interest.					

4) On 1-10 scale, 10 being highest, rate your subject's likings:

Physics	
Chemistry	
Mathematics	
Computer	
English	

5) Tick the below based on your interest for each column:

☐ Producing tangible results	☐ Solving abstract problems	☐ Composing music
☐ Fixing things	☐ Analyzing information	☐ Decorating
☐ Constructing, building	☐ Conducting research	☐ Playing instruments
☐ Being outdoors	☐ Learning new facts	☐ Designing
☐ Making things work	☐ Exploring theories	☐ Going to museums
☐ Working with my hands	☐ Collecting data	☐ Writing poetry, stories
☐ Hunting, camping, hiking	☐ Detailed activities	☐ Reading
☐ Solving problems	☐ Academic achievement	☐ Being Emotional
☐ Repairing, refinishing	☐ Developing knowledge	☐ Being expressive
☐ Using equipment	☐ Designing systems	☐ Being brave and daring

☐ Working in groups	☐ Speaking in public	☐ Keeping records
☐ Supporting others	☐ Debating ideas	☐ Making charts, graphs
☐ Building relationships	☐ Persuading, influential	☐ Writing reports
☐ Communication	☐ Chairing committees	☐ Attention to detail
☐ Listening to people	☐ Competing	☐ Using computer software
☐ Collaborating	☐ Asserting ideas	☐ Conducting analyses
☐ Encouraging	☐ Taking risks	☐ Creating efficiency
☐ Helping others	☐ Earning money	☐ Performing calculations
☐ Teaching, instructing	☐ Being an entrepreneur	☐ Following the rules
☐ Coaching, training	☐ Negotiating	

Coding For Questionnaire:

- **Gender:**

GENDER	CODE
Male	1
Female	2

- **Age:**

AGE	CODE
Below 23	1
23-25	2
26-28	3
Above 28	4

- **Percentage /CGPA in the last Degree:**

Percentage	CODE
40-49	1
50-59	2
60-69	3
70-79	4
80-89	5
90-100	6

- **Year of passing the last education:**

Year	CODE
2014	1
2015	2
2016	3
2017	4
2018	5

- **The number of interviews face:**

No. Interviews	CODE
0	1
1	2
2	3
3	4
more than 3	5

- **Marital Status:**

	CODE
Married	1
Unmarried	2
divorcee	3
Widowed	4

- **Number of dependents in the family:**

No. of dependents	CODE
1	1
2	2
3	3
more than 3	4
None	5

- **I will continue with my present career:**

	CODE
Yes	1
No	2

- **I am currently working or not working:**

	CODE
Working	1
Non- Working	2

- **Occupation:**

	CODE
self-employed	1
Job	2

- **Working Sector:**

	CODE
Government	1
Private	2
Business	3

- **Years of work Experience:**

No. of years	CODE
1	1
2	2
3	3
4	4
5	5

- **Type of work are you doing:**

	CODE
Field Work	1
Office Work	2

- **How many times have you switched you? Job / Business?**

	CODE
0	1
1	2
2	3
more than 3	4