# CLASSROOM TRAINING VERSUS E-LEARNING

An evaluation of the effective training delivery approach and the impact on employee performance in the Information Technology sector in India

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## Abstract

### Purpose

The aim of the research is compare and identify the effective training method used in trainings and analyse the impact on employee performance in the Information Technology Sector in India. A quantitative research will be used for this research with an attempt to evaluate employee's opinion on which training method has more impact on their performance.

### Design/ Methodology/ Approach

The research used quantitative research method and the positivist paradigm for data analysis. A questionnaire developed for this study included the multiple choice questions which helped in gathering the demographic information of the participants. Additionally, there were 26 statements based on the Likert scale response which helped in gathering the opinion of the employees based on the two training methods. The snowball sampling technique was used to gather the data as the research demanded a larger greater participation.

### Findings

The findings suggest that there is inclination towards the e-learning approach compared to classroom training. In addition, understanding concepts upon attending the training and the overall experience are the two parameters which have a high correlation in employees performance at the work.

### Practical Implications

Employees are the backbone of the organisation. There are highly significant and are accountable for accomplishing most of the task. Their active participation and contribution in the organisational success or downfall cannot be underestimated. Consequently, maximising the job performance of these unique assets using effective training becomes imperative to the organisations. These trainings not only encourage them to take on the day-to-day challenges, but also nurture them to adapt to the competitive business world. In order to impart the knowledge and inculcate the relevant competencies to these employees to ameliorate their job performance, it is advisable that organisation use effective training methods ( Elnaga and Imran, 2013). Although extensive research has been conducted in the area of the Human Resource Management, the same cannot be said on employee training especially as it concerns developing countries.

### Keywords :

Classroom training, E-learning, Performance, Trainings

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# Table of Contents

**List of Figures :**

**List of Abbreviations**

IT Sector : Information Technology Sector

MNC : Multinational Corporations

HRM : Human Resource Management

HRD : Human Resource Development

# 1. Introduction

## 1.1 Background of the Research

The world of business has experienced notable transformation as a result of globalisation, economic advancements and introduction of new technologies. Every organisation strives to sustain and achieve a significant position in the competitive business world. In order to set an benchmark in the market, they compete with other organisations in the same industry. In pursuance of achieving these goals , it is imperative that organisations handle its human capital effectively. Employees play pivotal role in the organisational success and are often considered as major assets of the organisation. Thus, it is advisable that they not only communicate the goals and objectives of the organisation, but also introduce them the to the current affairs in the industry and the latest trends in the market (Kovach and Cohen, 1992). Considering the contribution of skilled employees in achieving the organisational objectives and goals, using effective training methods for their development becomes responsibility of the organisation. The employees are 62% more likely to stay in the organisation for a longer time if they receive the right knowledge in the training to do their job efficiently. Hence they should be trained consistently and effectively using right methods and global insights (IBM , 2014). Thorough knowledge transfer using the right methodology is the key.

Gold *et al.* (2010) states the training conducted by organisations may have positive or negative impact on the employee's performance at work. However, the training delivery method used by the organisation is the crucial parameter which defines the success or the failure of the training program. With the introduction of numerous training delivery methods available in the learning and development domain, organisations often face challenges in determining the appropriate learning style for a particular training. Two frequently used training methods used by organisations are classroom training and e-learning

Classroom training, also known as classroom instruction is a traditional learning method used by organisations. This training delivery method involves a day or two away from normal routine work. It encourages the employee to completely focus on acquiring the required skill using interactive methods such as games, group discussion and presentations. Personal interaction and exchange of ideas with the instructor and other employees is considered as the unique feature of this training technique.

On the other hand, with the introduction of new technologies in the business , the concept of e-learning emerged a few decades ago. This training delivery method is considered as modern learning technique which involves the usage of internet and electronic media. E-learning was adopted by several organisations due to it features such as flexibility and convenience.

## 1.2 Research Problem :

Every year, the selection of appropriate training method to meet training objective is becoming more challenging. The domain of learning and development has evolved over a couple of decades with the introduction of technology and new adult learning methods. Many people think that training of any sort will benefit the company. However, an organisation might have to face serious repercussions in the training program is developed with the training process and delivered using an inappropriate method.

Trainings provides employees the knowledge and skills they require to perform their jobs effectively. However, training intervention is only an opportunity for learning. What is learned depends on design and implementation of the training program. Furthermore, as instructional methods differ in the ability to influence the skills and knowledge of the trainees, it is obligatory to evaluate the strength and weakness of the training delivery method and make a comprehensive decision. To date literature and reports suggest that there is rush in adopting e-learning training method in organisations. It is being used as an alternative to traditional classroom training (Nemanich, Banks and Vera, 2009)

The objective of this research is to determine, which style of learning is preferred, and subjectively more effective and better valued by the employees of the Multinational Corporations (MNCs) in Information Technology Sector (IT Sector) in India, and its impact on their performance.

## 1.3 Background of the Information Technology Sector in India :

With the introduction of few MNCs , the domain of software development established its existence in India in the early 1980s. However , the economic liberalisation in the year 1990 proved to be the prominent reason for the Information Technology Sector (IT Sector) to flourish in India. Over the last few decades, there has been an paradigm shift for Indian IT industry from being considered as out-sourcing destination to currently being considered as a destination for product development. Thus, making it the largest employer in the private sector domain. Figure 1 illustrates the evolution of the IT Sector in India.

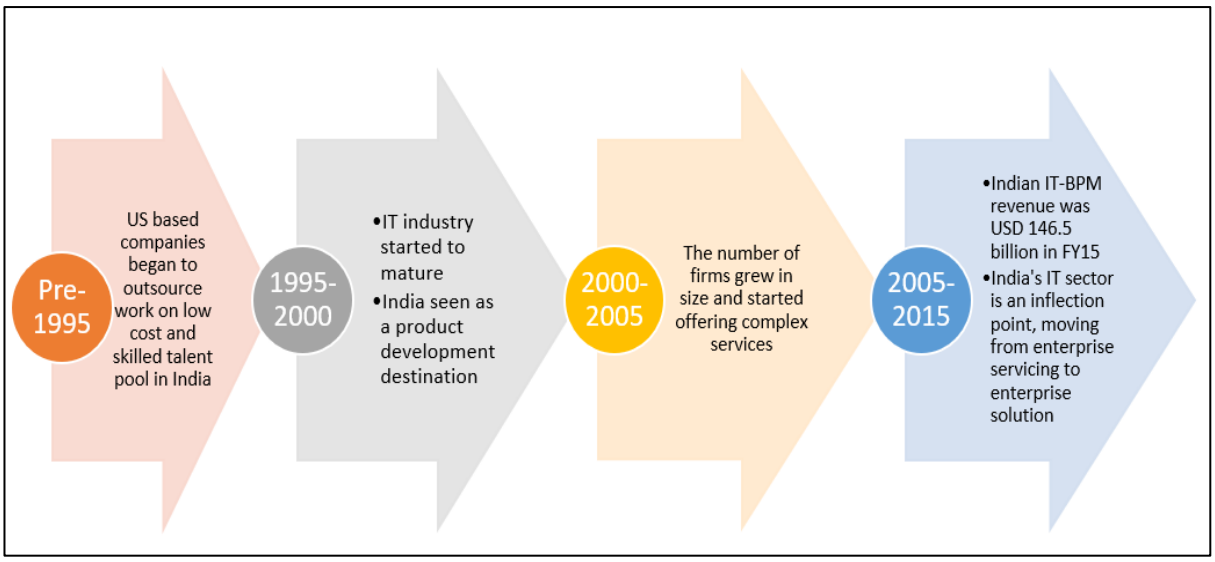



Figure 1. Evolution of the Information Technology Sector in India

Organisations in the IT Sector are often observed to nurture their employees because, in their opinion, employees cost and productivity are directly proportional. These two factor determine the gross profits of the organisation and thus help them maintain competitive advantage.

The context for this research is the Indian IT Sector. Despite of an economic environment, which is extremely challenging in nature, the demand for the IT services indicates is growing rapidly at the rate of 6.3%, which is above average. According to the data, this estimates to $968 billion in the year 2008 (NASSCOM, 2009). As per the records for 2007, the IT sector in India contributes $71.7 billion in the total $968 billion sector. Over 2.23 million employees work in the IT sector in India and is increasing at a galloping speed. This number is almost in two digits over the last decade. However, this façade of growth conceals the negative aspects of the higher education in India. As a result, a vast majority of the graduates realise that they do not possess the required skills while the seek employment opportunities. Skill gap is observed even in the human capital of the organisations in the United States of America. However, the skill gap considerably wider in the Indian IT Sector. Consequently, organisation invest fortunes in training and development of the these employees (Srimannarayana, 2017). Organisations take complete responsibility of the continuous development of their current employees as well as the new hires using appropriate training interventions. These interventions help them to cater to the needs of the clients and boosts their knowledge in the domain.

Let us consider the example of Infosys, one of the top ten MNCs in India. In last five to six years, this organisation augmented the their training investment by 16%. While Infosys now invests 8% of the revenue in training, in the year 2002 , it invested on 3.3% (Infosys, 2018)

However, even if this sector looks expansive and assuring on the periphery, there is a certain degree of the impediment in the demand-supply ratio of these organisations which seems to widen in recent times (Rao and Balasubrahmanya, 2017).

Precisely, at this stage , it is not only necessary to relook in to the frequency of training conducted, but also imperative to incorporate effective training delivery method used to impart skills and knowledge to these employees which will enhance their performance and bridge the gap.

### 1.4 Research Questions and objectives

In light of the backgrounds above the research aims at :

- To understand the correlation between training and performance.
- To compare and contrast the differences between traditional classroom training and the modern concept of e-learning
- To deduce the preferred training delivery method out of the two from the perspective of the employees.
- To identify which of the two training methods is effective based on the pre-defined parameters and the impact on their performance.

## 2. Literature Review

### 2.1 Human Resource Management

Human Resource Management (HRM) implies embracing a strategic and holistic approach for the management of the human capital in the organisation, as they are the highly valued assets of the organisation (Armstrong , 2006). There are four aspects that contribute in the meaningful fortification of the term Human Resource Management : a pre-defined set of assumptions and beliefs, a platform involved in the process of making rightful decision about employees in the organisation, inclusiveness of the managers and senior managers in the decision making and last but not the least, establishment of certain parameters which shape the employee relations in an given organisation (Storey ,1989). Hence, it can be said that HRM forms the fundamental pillar of the company. Numerous models were developed by theorists to give an explicit idea of functions of HRM. In the context of this study are the core functions of HRM elucidated by (Briscoe , 1995). Figure 2 illustrates these HRM functions and the allied activities in each function. As mentioned in above, this research will essentially focus on the two functions: training and performance, highlighted in red in the figure below.

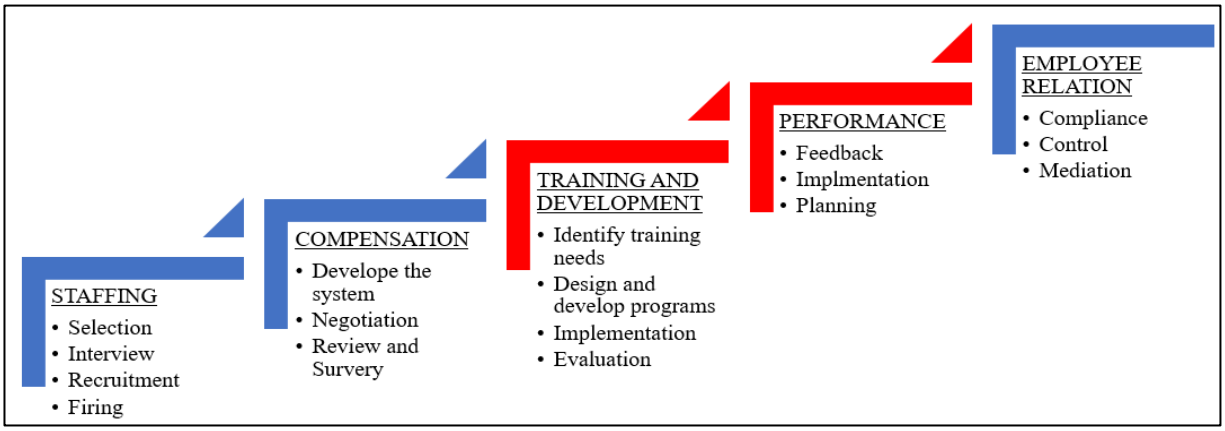



Figure 2. Human Resource Management functions and allied activities

Before we proceed to explore the two functions and the correlation between them, it is vital to note that they form a part of the Human Resource Development (HRD). As the name suggest, HRD focuses aspects strengthening the work force of the organisation by providing them learning opportunities and tracking their performance by using different intervention such as feedbacks, coaching, mentoring and much more. Hence, HRD is argued to be the most important function of HRM (Stewart and Rigg, 2011).

## 2.2 Training

According to the report published by IBM (2014) , 75% to 80% managers are of the opinion that success of any project depends on the training provided to the employees. The also observed an increase of 10% in the productivity if the employees received training on the pertinent skills require to perform their tasks. With the changing nature of work structure, it is observed that training objectives have been elaborated in such a way that they focus on delivering and inculcating the specific skills required by professionals to perform their tasks and cater to the needs of their clients. Considering the importance of this function, numerous academicians and authors above contributed to the literature by compiling a definition from their perspectives (Garavan , 1997).

Wimalasiri (1995) underlines that training is a process that has significant impact not only on the knowledge of the employees, but also gives a new dimension to their perspectives while performing their daily tasks. However, this definition was contrasted by Yadapadithaya. The learnings from the training can reflect in the aptitudes of the employees, but cannot assure to influence the attitude of employees about their jobs (Yadapadithaya, 2001). Lynton and Pareek (2011) argued that in order to achieve the training objectives, it is vital to adopt of strategic plan. Bradford *et al.*(2017) articulated the need to use an effective training method in order encourage the employees. In his opinion, creating interest about the subject matter is major factor that contributes in the success of the training program.

Considering the amounts invested by organisation in the training and development of the employees, it is fair to expect returns on investment. Thus, the training execution and approach used for a particular training program has a direct impact on the knowledge transfer and subsequently the employee performance. Needless to say, thorough knowledge transfer and the impact of training on the employee performance are the parameters that define effectiveness of the training methods.

## 2.3 Benefits and Drawbacks

Blanchard and Thacker (2004) bring into limelight the Ten- Point Training Philosophy proposed by Moller in 1987, which is very apt concerning the function of training. Figure 3 illustrates these ten points.

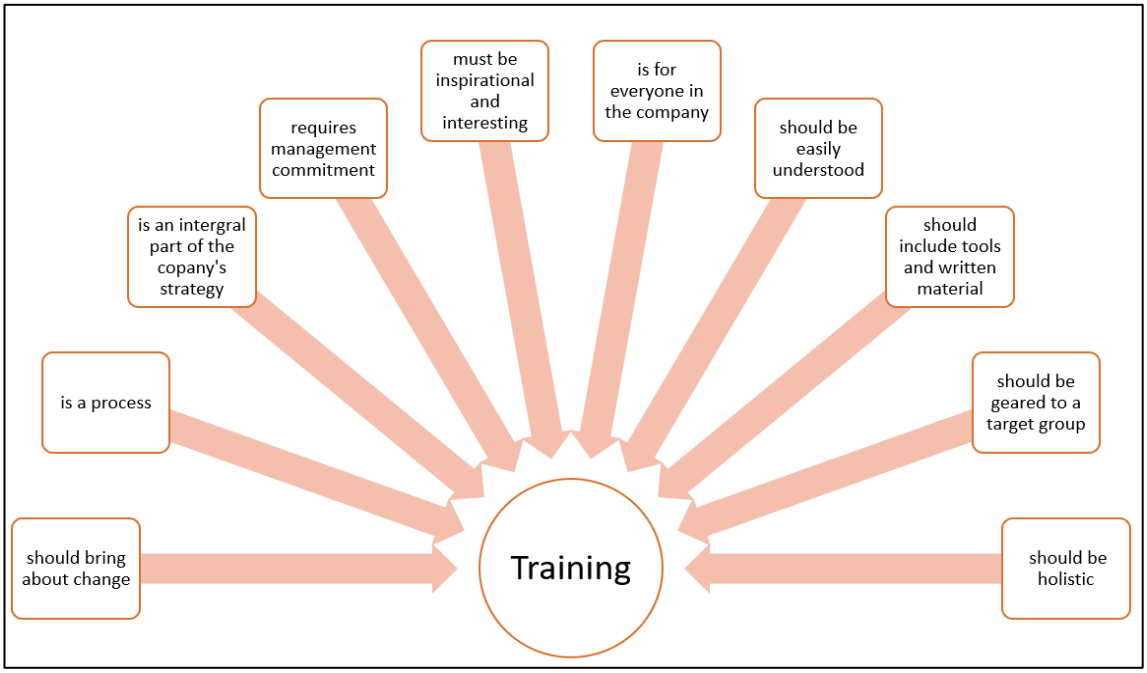



Figure 3. The Ten-Point Training Philosophy

Despite the guiding principles, training has both benefits and drawbacks. Starting off with the benefits of training, there is only a little that cannot be achieved when human capital is training well. Supportive learning climate while training befits the objectives, this helps both the organisation as well as the individual to reap benefits (Hearty and Collings, 2006). A report by Kalambi (2015) states that training have a sequential impact. While individual benefits are intrinsic in nature, they have an impact on the organisation as well. This implies that individual and organisational benefits are like connecting dots. Individual benefits include improved communication, co-operation and co-ordination along with high morale amongst the team. As a result, if the employees give their best to the organisation, it benefits by securing repeat business, increasing profit and enhancement in working as a group at all levels.

While appreciating the benefits of training, it is also imperative to consider the drawbacks of training. To note a few, trainings cannot solve problems of faulty organisations (Blanchard and Thacker, 2004). This implies that even if trainings is considered as then major function of HRM, it can only guide the employees and the management by providing them the possible methods to tackle the issue. Secondly,

trainings tends to disregard the fact of forgetting is easier and quicker than learning (Williams van Rooij, 2012). Brahmana *et al.*(2018) seconded this chain of thought by arguing that trainings cannot materially increase the learning potential of the employees and guarantee performance. Given the fact that training is one of the major component that gives a competitive edge to the organisation, it is vital to train the employee using appropriate training approaches which not only develop interest in their jobs but also encourage to perform.

### 2.4 Training Delivery Methods

Hodges (2002) states that there is only one right way to do things. Needless to say, in the modern, globalisation driven world, the notion "One size fits all" does not apply to human resource development. Every year, the selection of appropriate training method to meet training objective is becoming more challenging. The domain of learning and development has evolved over a couple of decades with the introduction of technology and new adult learning methods. Such instances give rise to conflict in the employees' mind (Simmonds, 2006). While the traditional training delivery approaches include lectures, classroom training , demonstration, case studies , the new training methods include distance learning, e-learning and other technology based learning methods. Another key concepts which distinguishes between these training methods are synchronous versus synchronous learning (Armstrong, 2006). The traditional training delivery approaches are synchronous where the trainees learn the subject matter in a group setting. On the other hand, the asynchronous learning method is where individuals learn at their own pace and at their comfortable place. This is possible when the trainings offered are e-learning or distance learning courses (Strang, 2013). Hence, it is advisable that organisations adopt effective training delivery method which is leaner-centred.

A framework was established Marchington and Wilkinson (1996) which aims to contribute in the analysis of learning methods and differentiate with respect to basic criterion. While the X-axis indicates if the learning method is individually or group based, the Y-axis represents is andragogical (self-directed/participative) or pedagogical (controlled by a facilitator/ trainer). In the context of this study , figure 4 illustrates the position of the two learning methods based on this framework.

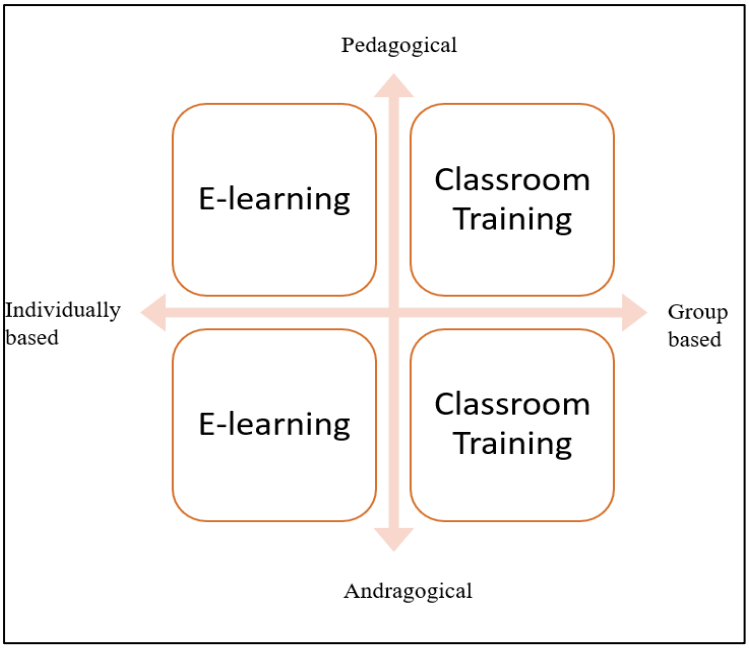



Figure 4. Framework of Training and Learning Methods

### 2.5 Classroom Training vs. E-learning : The Debate

Globalisation and numerous technological developments have reshaped our perspective about adult learning offerings. E-learning is one amongst the reforms brought in by technology. However, there is huge debate in the current times pertaining to the effectiveness of the traditional classroom methods versus e-learning. E-learning approach has a distinct features (Oiry, 2009). Time effectiveness is the major benefit of this training delivery approach. In addition, cost-effectiveness in delivery and providing updateable material are other allied benefit. From the perspective of the organisation, adopting this training delivery method helps them interconnect with the employees all over the globe. The non-linearity in this instruction method encourages the process of knowledge acquisition. Due to the presence of intense and diverse characteristics of e-learning, it is considered revolutionary and is assumed being more effective than the classroom training (Criu and Coebanu, 2013). However, over a last few years, there has been a high rush by the organisations to implement e-learning training approach without studying the potential issues and gaining insights from the debates about the training delivery technique (Gold *et al.*, 2010). Friesen (2004) argues that it is difficult to establish a learning object purely using technical perspective. It is a claimed benefit that all leaners receive and experience the same learning. However, the claim is questionable on the grounds that every individual is unique and consequently, experience the learning phenomena differently and uniquely. The second debate centres on the issue of trust. It has been observed that certain e-learning modules and platforms have functional setting that enable the administrative systems to closely monitor the activities and the progress of the learners. Such monitoring activities indicate lower level autonomy which

contradicts the benefits of this training delivery approach (Tervartanyan and Kleiner, 2015). Further studies on topics also deduce some significant observations. The trainees reported that there was no significant difference observed between the conventional training methods and e-learning (Sambrook *et al.*, 2001). It was observed from the employees' perspectives that there was no significant difference between other training approaches and e-learning. However, a wide range of common factors to most of the approaches have an impact learner's response and thus the effectiveness of the training delivery approach. In a recent survey conducted by an organisation in the United Kingdom, it was observed that 26% of the employees discontinued taking e-learning training. (Emilova, 2016).

Despite of the buzz of the learner-centred and other creative techniques used in the training of employees, the formal training courses still rated the most effective training method of learning. Bernard *et al.* (2004) proclaims that irrespective of the claims and debates of the modern training techniques, traditional approaches still occupy a significant importance in the learning and development practices. Numerous reasons can justify the above declared statement. Classroom training are designed and implemented in such a way that they cater to the current needs of the organisation by providing them rightful skills. Additionally, these training also cater to the needs of the clients. This can be achieved only because classroom training are specifically tailored to meet the organisational needs. The fact that classrooms training are conducted away from the regular work environment is the plus point of the training methods (Boak and Crabbe, 2019). This helps the trainees to focus on what is being taught and keeps them away from other distractions. In addition, this approach give them an opportunity to practice the skills acquired in the training using interactivities discussion , activities, role plays and many more ways. Learning the skills on a virtual platform and implementing them directly can have negative consequences if there exists a knowledge gap. In contrast to these favourable characteristics, (Cahoon *et al.*, 2011) stated that classroom trainings are rigid in nature as they are led by the trainer. Trainees often become passive receptors in classroom training. In addition, these training do not cater to the individual needs of the employees. Consequently, they cannot apply the knowledge and consider these trainings are waste of time. Evidences indicate that employees attend classroom trainings in order to bridge the gap present a strong annual report during the appraisal meetings.

In brief, there are two thought streams about the superiority in the of between traditional classroom training and e-learning approach and the effectiveness. While some views and opinion argue that classroom training is the viable resource for training and development, the pro technology studies support the usage of the e-learning. But there is no substantial evidence that the two training approaches could be replaced in terms of effectiveness.

## 2.6 Performance

Employee performance is the extent to which an employee executes the tasks effectively and efficiently (Taylor, 2014). In simplified terms, employee performance is a result of application of multiple abilities that an employee demonstrates in order to achieve individual goals, which further contributes in achieving organisational goals. These abilities involves work attitudes, organisational communication , finding solutions to challenges in addition to the routine tasks (Taylor, 2014). Lebas (1995) stated that employee's performance is measured against the performance standards set by the organization. Hence, it is duty of the management to ensure that the organisation thrives and adapts itself to changes smoothly by achieving high performance levels. The managers must set out clear expectation from the employees in terms of performance.

Organisation ensures the contribution of their human capital in producing quality products using performance management as tool. Performance management tool intends to create a suitable work environments for the employees which fosters continuous development the skills and contributions of an individual towards to organisation. It is considered as key part of the employee management relationship (CIPD, 2017). When employee performance is monitored and managed, it stimulates the employee to contribute and thus feel motivated to perform with the highest degree of dedication. Results of the previous works indicate that employee satisfaction and employee performance are directly proportionally. A rise in the employee satisfaction leads to a rise in his performance (Dutton and Kleiner, 2015 ). Further studies in this domain indicate when employee performance in high amongst the workforce, the management relies on these resources and encourages to perform by providing the necessary tools to achieve organisational targets. Amongst the five HRM factors to have direct impact on the employee performance, training and development have the prime position (Ridley, 2007). It empowers employees to perform.

## 2.7 Correlation between training and employee performance

Extensive research in being conducted on the topic of trainings and its impact on employee performance. (Carliner, 2004) claims that appropriate training interventions is the best solution to bridge the performance gap. This helps employees to upgrade their skills required to perform the tasks. This argument was seconded by Nguyen and Klein in 2008. Training intervention by organisation does not merely upgrade the employee skills and performance but carry out their jobs effectively (Nguyen and Klein ,2008). By stating this they underline the subtle difference between performing as task and performing a task effectively. Hence, it is wisely said the HRM practices and employee performance are directly proportional and has a subsequent impact on the organisational performance.

Further studies conducted to establish the correlation have significant observations. Sartori *et al.* (2018) highlights some training programs do not attain the intended training objectives. Hence, it becomes the responsibility of the management to dig deep in to the root cause of failures of these training by conducting training evaluations. With the introduction of multiples training methods, researchers present a new ideology. Lapidus and Kazakov (2017) delineates that in order to see visible changes in the employee performance, it is vital to use the effective training methods. Training intervention using effective training design and training methods yield better results (Gavril *et al.*, 2017)

## 3. Methodology

Methodology section facilitates the better understanding of the end-to-end process implemented for the research work in order to obtain accurate information and thus, meet the research objectives. This chapter delineates the methodology employed for this study. It adheres to the Onion Framework established by (Saunders *et al.* , 2009) which involves an elaborate discussion on the following topics. Furthermore , it also discuss the ethical considerations and the limitations. Figure 5 illustrates the phases of the onion framework specifically in context to this study.

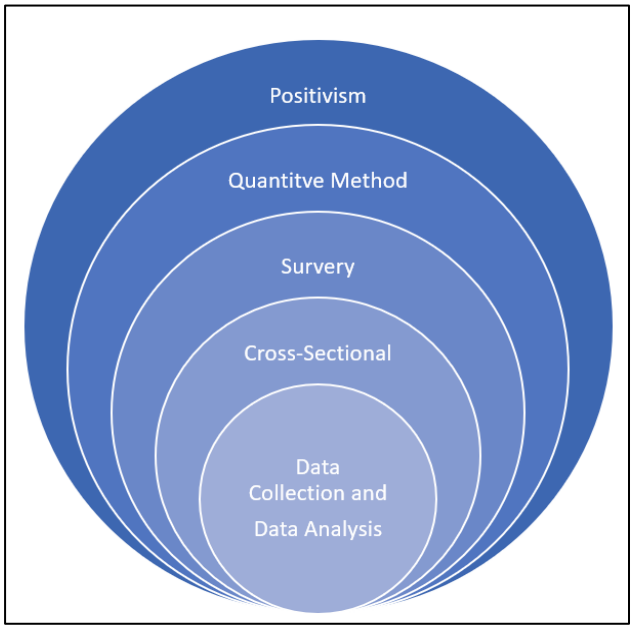



Figure 5. Research Onion Framework

### 3.1 Research Method and Philosophy

Three established and potential research methods have been enumerated in order to conduct a research : qualitative research method , quantitative research method and a blend of both methods. While the qualitative research method emphasises on the understanding a respondent's view point , quantitative research method focuses on verification of testing the responses and verifying the facts (Cahillane and Schweppe, 2016). Simplistically, qualitative research method aims at redefining something based on identified themes and illustrations, in contrast to the quantitative research method aims at measuring individual opinion using statistical data and allied tools. In addition to these basic definitions of the methods, one more distinguishing factor between the two methods is the data collection method. As the two research methods aims to study different aspects, it is imperative to use the correct data collection method to gather the required information for the analysis (Helin *et al.*,2014). Quantitative research method use questionnaire or surveys to gather data. At times, researchers use data sets which are available online on data repositories. On the other hand, data collection for qualitative research method involves interviews, group discussions and observations.

One of the most unique distinguishing factor between the two research methods is the allied research philosophy.

Research philosophy refers to the ideologies and beliefs that determine the ways in by gathered information should be analysed and used. The philosophical aspect hold a prime importance in the research as it is global view of that gives a direction to the investigation (Mkansi and Achempong , 2012). Research philosophies are classified in three types : realism, positivism and interpretivism. The western sciences mainly focus on using positivism and interpretivism ( Mkansi and Achempong , 2012). The positivist philosophy sticks to belief that factual knowledge gained using the appropriate instruments are trustworthy. When a researcher decides to adhere to the positivist philosophy for his study, it is given that there is minimal interaction in the between him and the research participants. Thus, collecting data and interpreting the facts are primary tasks of the researcher in the positivist philosophy. The positivist paradigm thrives on facts regards the world as purely objective. Hence, positivism is deeply associated with quantitative research method (Grosu, 2014). Au contraire, interpretivist paradigm is based human interaction. Researchers adhering to this research philosophy are of the view that social interaction is the only way to obtain realistic opinion and information. In order to connect with the target audience, there researchers use tools like interviews and discussion. Thus, it is rightly said that interpretivism is deeply associated qualitative research method.

The aim of this research is to compare and contrast the effectiveness of the two training methods: classroom training versus e-learning and evaluate its impact on the employee performance. In simplified terms, this research attempts to identify the preferred training approach between the two approaches and evaluate its impact on the employee's performance. This study is thoroughly based on the perception of the employees. Considering this aim and the success rate of the quantitative research method in similar studies, this is study will adhere to the positivist philosophy and thus quantitative research method to answer the problem statement and meet the research objectives.

### 3.2 Research Instrument :

As data is the foundation of any research work, selection of appropriate data collection method is vital in order get the a pertinent data. Data is categorized in two types : primary data and secondary data. Primary data is also popularly known as real time data. Data gathered by the researcher for the first times by himself is primary data, while secondary data is that information which is collected by other researchers for different purposes. This information can be available through different websites, books , journals and information resources. In the context of this research , the researcher uses primary collected specifically to conduct this particular research.

Numerous data collection instruments are available for researchers to conduct their study. On exploring the various options , the researcher finalizes to use survey/questionnaire for retrieving the required data. While some authors use the term 'survey', others use the word 'questionnaire'. Bourke *et al.* (2016) states that questionnaires are the most reliable instrument to receive public opinions and views regarding a particular topic. They are a source of direct first-hand information.

A wide range of benefits of using questionnaires have ben enumerated by researchers. This is data collection instrument is the most inexpensive tool and has the ability to gather data from the large target audience (Bourke *et al.*, 2016). A well-structured questionnaire with clear objectives has the ability to yield the best results. Described as one of the effective tool for gathering quantitative data , the researcher can use multiple statistical tools to identify the correlation between the variables and interpret the data (Brace, 2004). Despite of the benefits, there are some drawback of this research instrument. The minimal interaction between the researcher and the target participants can prove to be a hurdle. Time is a boon and a curse of this research instrument. There is high possibility that participants need multiple reminders to fill the questionnaire. At times, individuals may not revert to the questionnaires for the various reasons.

### 3.3 Instrument Design

Upon the selection of the research instrument, the next step was to design and develop the questionnaire. While developing the this questionnaire , two parameters were taken into consideration : target participants and length of the questionnaire. Participants often quit while responding to the questionnaire depending on the number of questions (Bourke *et al.*, 2016). The questionnaire was designed and developed using Google Forms. A standard template 'Forms' was chosen because of easy access and cost-effectiveness way in comparison to designing tools and websites. The option to choose between numerous options such as linear scale, grids, and paragraph responses helps is collecting minute data and conduct the data analysis in depth. A key feature of this designing tool is the access to individual responses and diagrammatic representation of the responses in pie chart and graphs.

The content of the questionnaire was developed based on the gaps found in the previous studies and literature review. The questionnaire was divided in two parts. The first part of the questionnaire focused on demographic details of the target participants. It is important to consider the demographic details of the participant as it can have

significant impact on his responses. The demographic details serve as base to compare different parameters in the study which makes it effective (Bourke *et al.*, 2016). The demographic questions in the questionnaire for this research included organisational experience, age and gender.

The second part was developed using set of statements and the Likert scale. The Likert scale was introduced to in the domain of research by a renowned scientist Rensis Likert (Kothari , 2004 ). In this method, a set of statements where in the participants are expected to agree or disagree each given statement. The standard Likert statement uses a range of five points in term of response scale. In the context of this research, the participant were offered statements based on the literature and asked to answer based on the degree of agreement.

### 3.4 Sampling Size

The term 'sampling size' is often used in research studies to define the number of participants who forma part of a sample. Sample refers to a group of individuals which are a part of the total population and are considered to represent the entire population to conduct the study.

As the research was conducted on the employees in IT sector in India, the designed questionnaire was sent out to potential participants using online social networks. The questionnaire was sent to approximately 130 participants and received 115 responses. Using the data cleaning techniques, 100 responses were found valid and used for data analysis.

### 3.5 Sampling Technique

After defining the potential participants, the question arises how to reach them. Thus, sampling technique refers to a process which facilitates reaching out the appropriate target participant. Several different sampling methods are available which a broadly categorized into two group : probability sample method and non-probability sampling method. For the purpose of this research, the researcher selected the non-profitability sampling method and the snowball sampling methods. The snowball method is commonly used across management research studies. In this method, the existing participants nominate more potential participants. It is said that the snowball technique is used when the it is difficult to reach the potential participants who fit in the sampling frame (Saunders *et al.* , 2009)

### 3.6 Data Analysis

In order to explore the data collected and gain meaningful insights from the responses, it is vital to conduct data analysis using appropriate data analysis methods and tools. In case qualitative analysis, it important the researcher finds a number of themes to analyse the data. Thus, the research has the option of choosing between numerous pre-established evaluation models like Kirkpatrick Model of Learning Evaluation, Kaufman's Model of Learning Evaluation , and Anderson's Value of Learning Model and many more. In contrast, tools such as Excel, SPSS , R Studio , Anaconda

Navigator and other statistical tools facilitate data analysis when the researcher opts uses the quantitative research methods.

In assistance of this study, the researcher adheres to the quantitative research method. Hence, the data analysis was carried out using the Statistical Package for Social Sciences (SPSS). SPSS is the most popular statistical tool used to analyse quantitative data (Bryman and Bell , 2011). The researcher conducted the analysis through descriptive and inferential statistics. The questionnaire of 26 statements was categorized into five parameters :

1. Understanding of concepts
2. Performance
3. Time
4. Interaction
5. Overall Satisfaction.

The above mentioned scales are some of the parameters that define the effectiveness of the training (Blanchard and Thacker , 2004). To begin with, the reliability test was conducted on the data to measure the overall consistency. The second step involved conducting normality test to analyse of if the data was normally distributed. At this point, it was inferred that the data was not normal. Hence, the researcher used the non-parametric tests to test the hypothesis for every parameter. Hence, hypotheses were tested using non parametric tests for different demographics for each parameter. Moving ahead, linear regression was used to find the linear relationship between performance and the four parameters except performance mentioned above.

### 3.7 Ethical Considerations

In research studies, ethics refer to code of conduct followed by the researcher while carrying out the study. The code of conduct includes rights to privacy, consent and anonymity. While conducting a research, extensive and whole hearted cooperation from the participants. Thus, an pre-established ethical framework boosts the participation along with the value of research. Ethical consideration such as data confidentiality , copy rights policy and anonymity are declare which secure intellectual possessions (Kothari , 2004)

In the context of this the study, the questionnaire developed by the contained a separated paragraph which stated that the information gathered would be kept confidential and anonymous. The participants were informed that they had the liberty to opt out of the survey anytime they feel they are not comfortable answering the questions. The participant were also informed that adhering to the NCI data storage guidelines , all the answers will be stored in safe place for one year after the thesis submitted. The study assures to provide information from reliable sources and forbids plagiarism. Relevant citations and references are provided in the references section of this study.

### 3.8 Limitations

During the development of any piece of work , challenges and limitations are bound to exist. This section highlights the major limitation of this study. When the questionnaire was sent out, many people responded on the same day. However, going ahead , it was observed that the a few participants required reminders to fill out to the questionnaire. A total of three reminders yielded 115 responses. Despite of reaching out to almost 130 potential participants , 115 responses were received. In addition, it was found that only 100 responses were valid to conduct the research.

## 4. Findings, Analysis and Discussion

The data collection consisted of a questionnaire of 26 statements with a scale response of Strongly Agree though to Strongly Disagree.

These were categorised into five scales:

- Scale A – Understanding of Concept
- Scale B – Performance
- Scale C - Time
- Scale D - Interaction
- Scale E – Overall Satisfaction

It also requests further details such as gender, age and total experience. The gathered data grants the researcher with an ability to understand respondents view towards e-Learning and Classroom training approaches.

### 4.1 Reliability Testing:

In this section we conduct the reliability tests based on the various scales considered for our study and check the individual results. We start with "Understanding the concepts". To check the internal consistency of the scale we make use of Cronbach's alpha test in order to check the reliability.

#### 4.1.1 Understanding

The questionnaire for this variable was designed in a way to capture the respondent's view in terms of the understanding gained and the clarity of knowledge achieved and understanding the concepts based on the two different learning approaches under consideration e-learning and classroom training are undertaken by the respondents. The questionnaire involved in total 6 questions to capture the opinion of the respondent towards time variable. The questions were answered on a scale ranging from strongly disagree to strongly agree.

To check the internal consistency of the scale we make use of Cronbach's alpha test in order to check the reliability. The significance of the results is based on the value 0.70, where if any value above 0.70 is considered highly reliable.

**Reliability**

**Scale: Understanding the Concepts**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 100 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 100 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .882 | 6 |

Figure 6. Cronbach's Alpha Test for reliability – Understanding the concepts

In figure 6, we represent the case processing summary and reliability test statistics for the parameter - "Understanding the concepts". It can be observed that there were 100 valid responses which were considered and 0 excluded from the analysis. Furthermore, the Cronbach's Alpha test for reliability is highly reliable (0.882) which is greater than 0.70

### 4.1.2Performance:

The questionnaire for this variable was designed in a way to capture the respondent's opinions about the performance gain achieved by them depending on the two different learning approaches under consideration e-learning and classroom training are undertaken by the respondents. The questionnaire involved in total 7 questions to capture the opinion of the respondent towards time variable. The questions were answered on a scale ranging from strongly disagree to strongly agree.

Figure 7 gives a summary of the various cases and reliability tests conducted for the "Application of Knowledge" scale. For this, there were 100 cases considered and were excluded. Based on the results obtained, it can be inferred that, there is a high reliability with a value of **0.936** which satisfies the test for the "Performance" scale.

**Reliability Scale : Performance**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 100 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 100 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .936 | 7 |

Figure 7. Cronbach's Alpha Test for reliability – Performance

### 4.1.3 Time:

The questionnaire for this variable was designed in a way to capture the respondents view towards the difference between duration and the pace with which two different learning approaches under consideration e-learning and classroom training are undertaken by the respondents. The questionnaire involved in total 2 questions to capture the opinion of the respondent towards time variable. The question is answered with on a scale ranging from strongly disagree to strongly agree.

The below figure represents the reliability test conducted using "Time" as the scale. The summary from the table states that, there were 100 valid cases and 0 invalid cases (respondents). Table below results a moderate reliability of 0.780 on the "Time" scale.

**Reliability**

**Scale: Time**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 100 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 100 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .780 | 2 |

Figure 8. Cronbach's Alpha Test for reliability – Time

### 4.1.4 Interaction:

The questionnaire for this variable was designed in a way to capture the respondents view towards the difference between the way the user interacts with the two different learning approaches under consideration e-learning and classroom training. The questionnaire involved in total 3 question to capture the opinion of the respondent towards interaction variable. The question is answered with on a scale ranging from strongly disagree to strongly agree.

The figure 9 indicates the reliability test for "Interaction" scale. There were 100 respondents out of which 100 cases were valid and 0 cases were excluded. From the reliability test results it can be inferred that the value for Cronbach's Alpha is insignificant (0.688) which is less than 0.70

**Reliability**

**Scale: Interaction**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 100 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 100 | 100.0 |

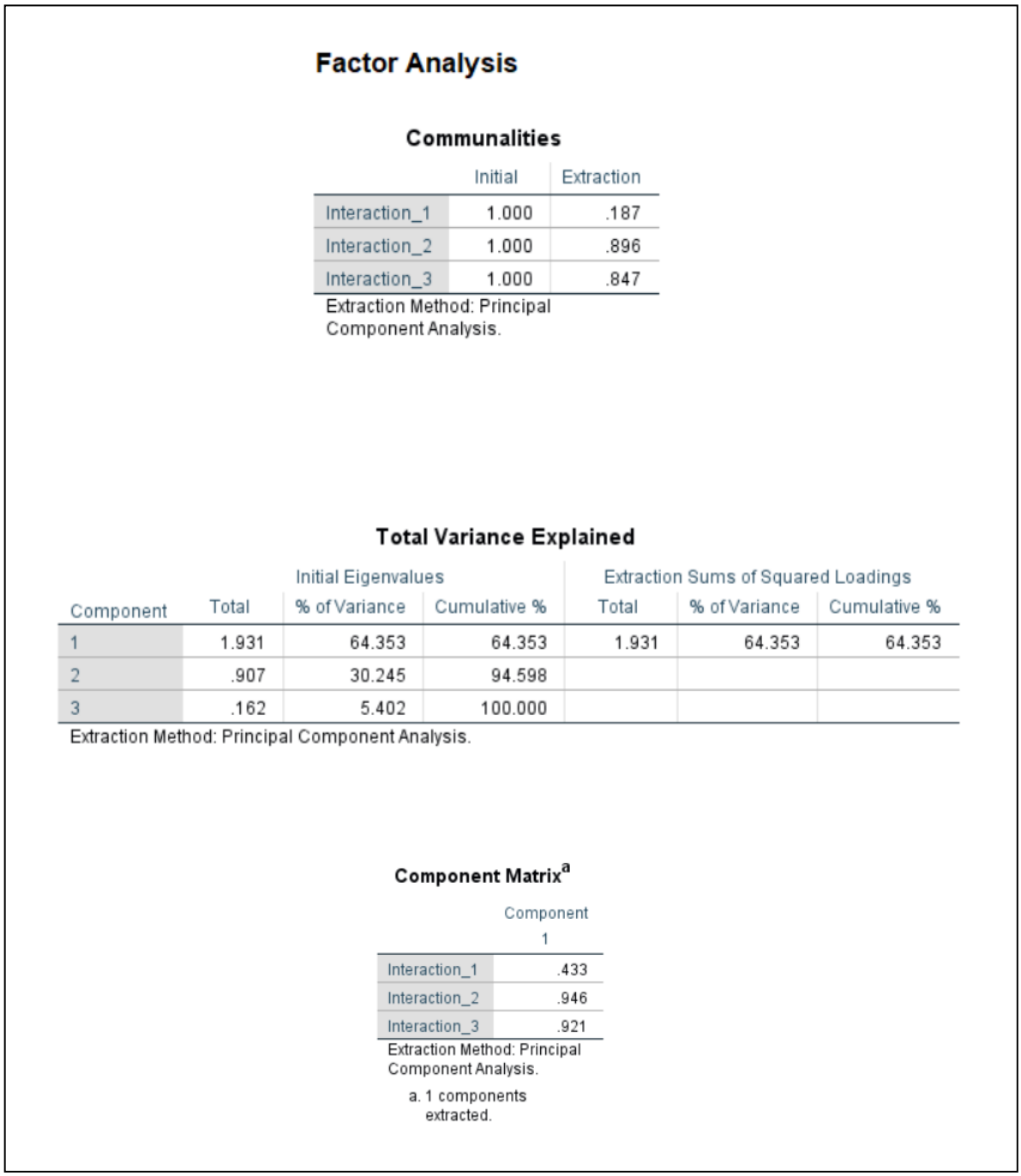
a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .688 | 3 |

Figure 9. Cronbach's Alpha Test for reliability – Interaction

Factor analysis of Scale Integration– Interaction variable is observed to have in total 3 components involved within it thus this can be helpful to explain the low reliability value for this variable. Thus, upon performing factor analysis we understand that the first component of the variable interaction does explain 64.35% of the total variance. Thus, for further analysis we will be considering the first component of interaction.



**Factor Analysis**

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Interaction_1 | 1.000 | .187 |
| Interaction_2 | 1.000 | .896 |
| Interaction_3 | 1.000 | .847 |

Extraction Method: Principal Component Analysis.

**Total Variance Explained**

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1.931 | 64.353 | 64.353 | 1.931 | 64.353 | 64.353 |
| 2 | .907 | 30.245 | 94.598 | | | |
| 3 | .162 | 5.402 | 100.000 | | | |

Extraction Method: Principal Component Analysis.

**Component Matrix[a]**

| | Component 1 |
|---|---|
| Interaction_1 | .433 |
| Interaction_2 | .946 |
| Interaction_3 | .921 |

Extraction Method: Principal Component Analysis.

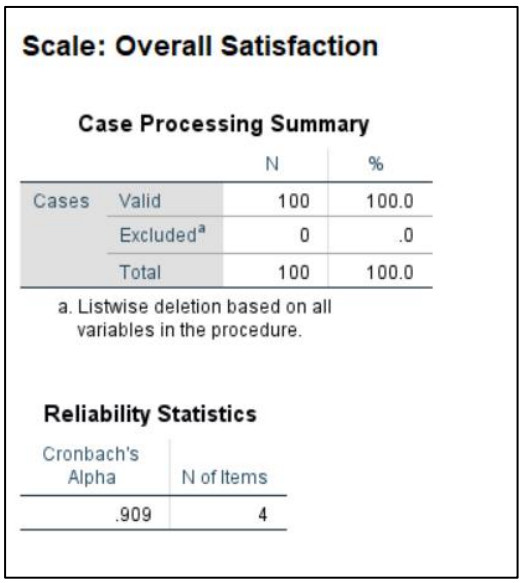
a. 1 components extracted.

Figure 10. Factor Analysis

### 4.1.5 Overall Satisfaction:

The questionnaire for this variable was designed in a way to capture the respondents view towards overall satisfaction level achieved based on the two different learning approaches under consideration E-learning and Classroom training. The questionnaire involved in total 4 questions to capture the opinion of the respondent towards overall satisfaction variable. The question is answered with on a scale ranging from strongly disagree to strongly agree.

The below tables represent the reliability test which has been conducted on the "Overall Satisfaction" scale. From the summary which gives the case wise processing numbers it can be noted that all the 100 respondents were valid, and 0 cases were excluded. The reliability test score is 0.909 which means that the "Overall Satisfaction" scale is highly reliable.



**Scale: Overall Satisfaction**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 100 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 100 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .909 | 4 |

Figure 11. Cronbach's Alpha Test for reliability – Overall Satisfaction

### 4.2 Normality Test

It is important to take into consideration the assessment of the normality of the data as a pre-requisite for any statistical test. This can be done graphically and numerically by performing two important tests. These tests are namely: Kolmogorov-Smirnov and Shapiro-Wilk test. We conduct these tests and outline the results for all the parameters below.

#### 4.2.1 Performance:

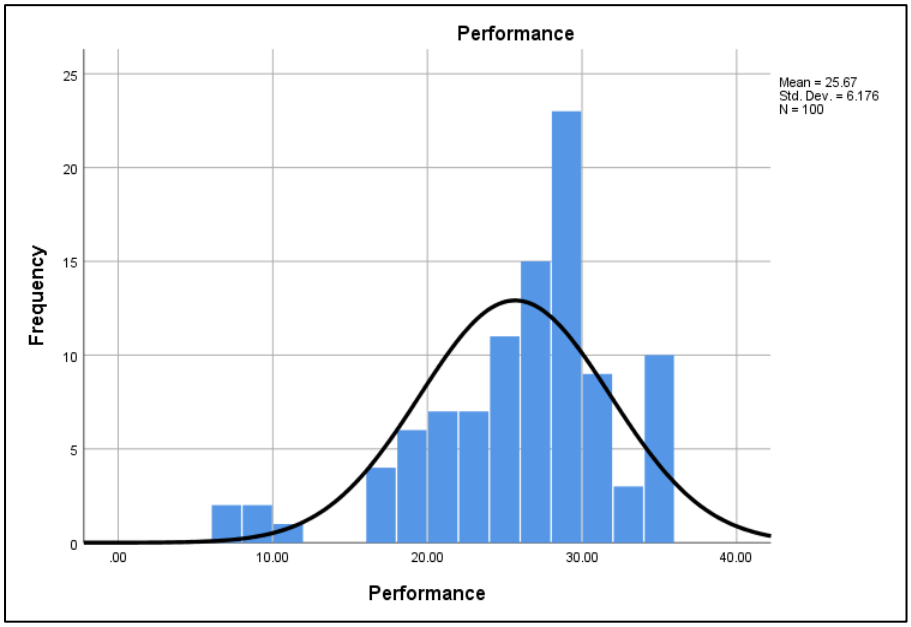



Figure 12. Histogram - Performance

| Tests of Normality | | | | | | |
|---|---|---|---|---|---|---|
| Performance | .127 | 100 | .000 | .929 | 100 | .000 |
| a. Lilliefors Significance Correction | | | | | | |

Figure 13. Normality Test- Performance

The histogram chart in Figure 12 shows normality distribution of the “performance” variable. It can be noted from the graph that the data is not normally distributed, and it significantly deviates from the normal distribution. This can be seen from the results obtained using the Shapiro-Wilk Test. As per the assessment conducted the significance value is 0.00 which is less than 0.05 resulting in the skewness of data. Having said that, the mean is **25.67** and the standard deviation is **6.176**

### 4.2.2 Overall Satisfaction:

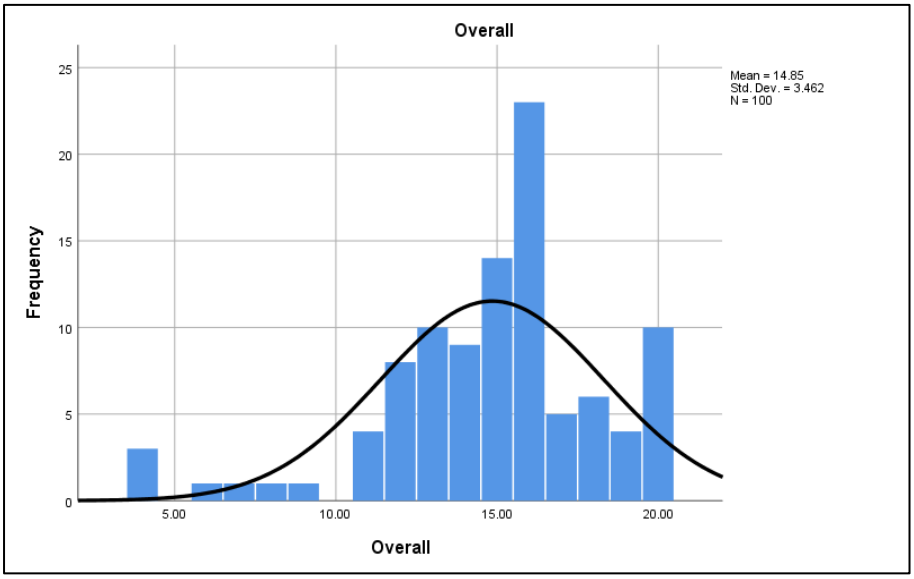



Figure 14. Histogram – Overall Satisfaction

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Overall | .137 | 100 | .000 | .913 | 100 | .000 |

a. Lilliefors Significance Correction

Figure 15. Normality Test – Overall Satisfaction

The above histogram chart shows normality distribution of the "overall satisfaction" variable. The data is not a normal distribution of figures. As such we can see there are many outliers resulting in the skewness of data. The results from the tests of normality state that the data is not significant because the value is less than 0.05. For the 100 respondents we obtain a mean value of 14.85 and standard deviation of 3.462.

### 4.2.3 Understanding of concept:

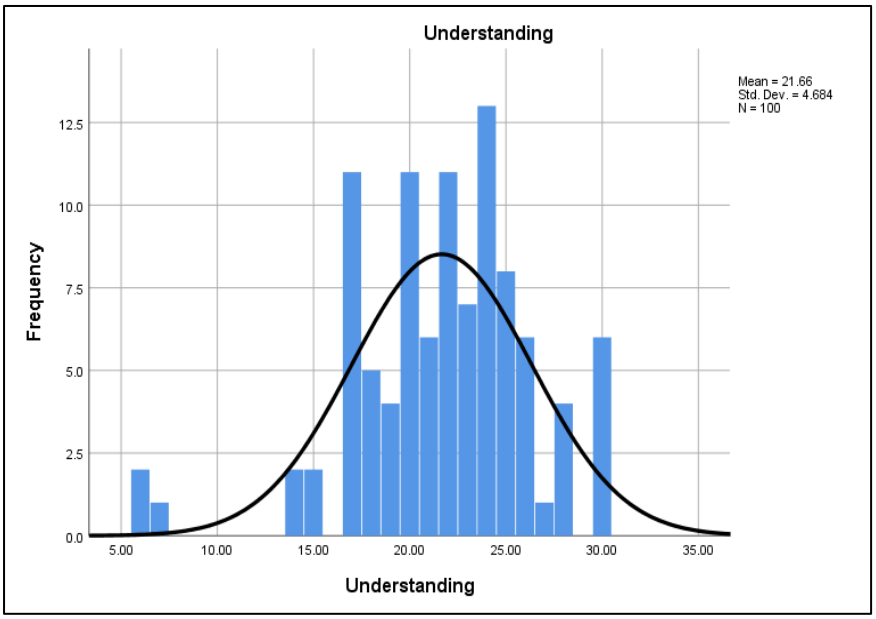



Figure 16. Histogram – Understand of concepts

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Understanding | .092 | 100 | .038 | .941 | 100 | .000 |

a. Lilliefors Significance Correction

Figure 17. Normality Test – Understanding of concept

The normality histogram chart for "Understanding the concept" variable shows that the data is not normally distributed. As such the mean of the resulting data is **21.66** for a count of 100 respondents and the standard deviation is **4.684.** Based on the normality test of Shapiro-Wilk it can be inferred that resulting variable is insignificant as the value is 0.00 which is less than 0.05.

### 4.2.3 **Time**

The following graph shows the histogram plotted for the time variable. Based on the data seen it can be inferred that the distribution is not normal. This results in an insignificant value of the Shapiro-Wilk test. As such the value seen is 0.00 which is less than 0.05 whereas the mean for 100 cases is 7.64 and standard deviation is 1.679

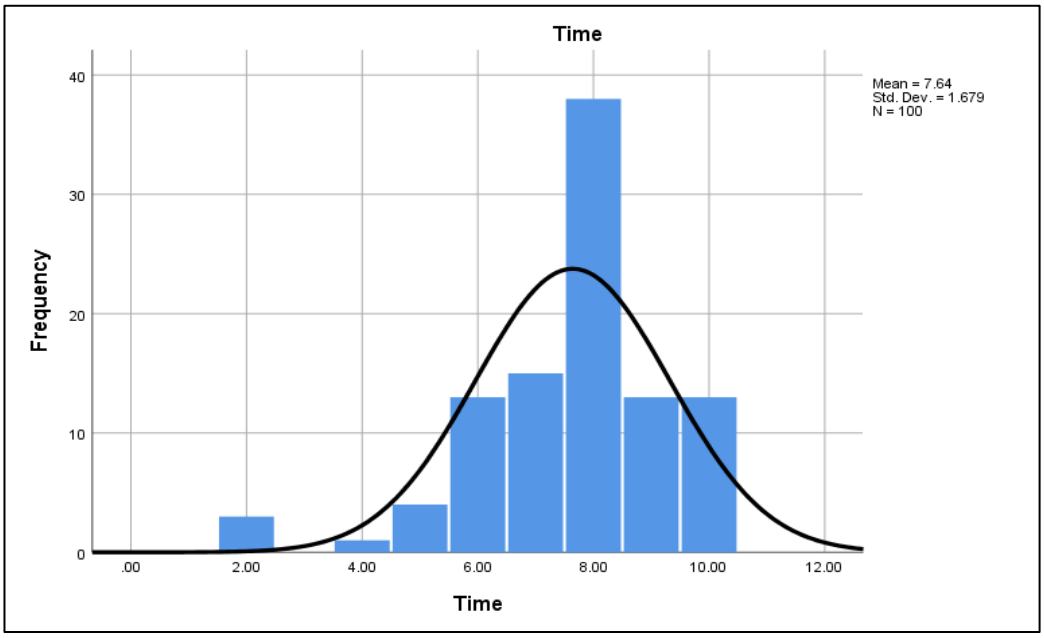



Figure 18. Histogram – Time

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Time | .225 | 100 | .000 | .884 | 100 | .000 |

a. Lilliefors Significance Correction

Figure 19. Normality – Time

### 4.2.4 **Interaction:**

The below histogram chart shows normality distribution of the “Interaction” variable. It can be noted from the graph that the data is not normally distributed, and it significantly deviates from the normal distribution. This can be seen from the results obtained using the Shapiro-Wilk Test. As per the assessment conducted the significance value is 0.00 which is less than 0.05 resulting in the skewness of data. Having said that, the mean is **3.41** and the standard deviation is **1.215**

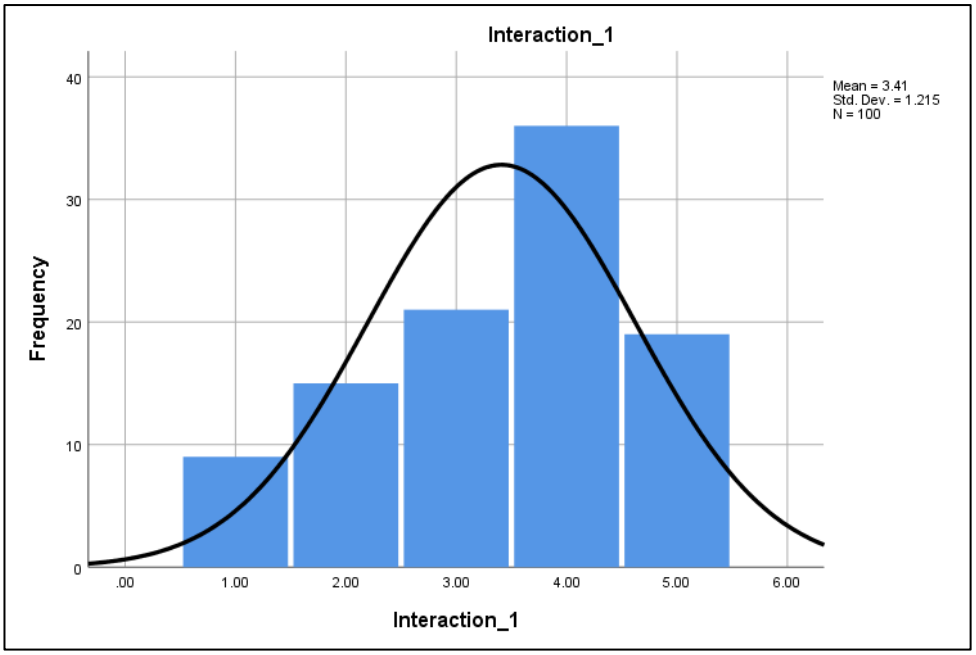



Figure 20. Histogram – Interaction

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Interaction_1 | .236 | 100 | .000 | .889 | 100 | .000 |

a. Lilliefors Significance Correction

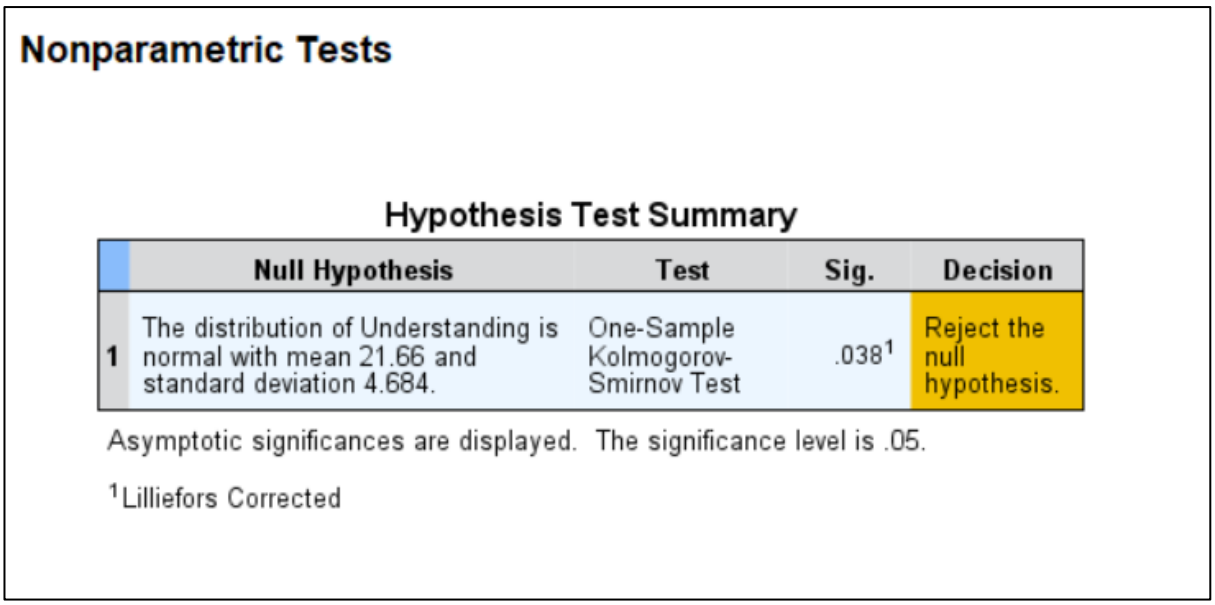
Figure 21. Histogram – Interaction

## 25.3 **Analysis for Understanding of concept:**

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning for the parameter understanding of concept.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning for the parameter understanding of concept.

As per the analysis done earlier, we have discussed that the variable “Understanding” is not normally distributed thus, we perform Nonparametric test.



**Nonparametric Tests**

**Hypothesis Test Summary**

| | Null Hypothesis | Test | Sig. | Decision |
|---|---|---|---|---|
| 1 | The distribution of Understanding is normal with mean 21.66 and standard deviation 4.684. | One-Sample Kolmogorov-Smirnov Test | .038[1] | Reject the null hypothesis. |

Asymptotic significances are displayed. The significance level is .05.

[1]Lilliefors Corrected

Figure 22 : One sample Kolmogorov-Smirnov Test – Understanding of concepts

The figure above shows the results for the performed one sample Kolmogorov-Smirnov Test. The results for the performance parameter depict a mean value of 25.67 for N of 100 samples. The p-value for the test is less the 0.05 thus, we reject the set null hypothesis. Thus, we can state that there is statistically significant difference between Web-based Learning and Classroom Learning for the parameter understanding of concepts.

### 4.3.1 Understanding of concept and Sex:

The test for normality is conducted for the scale of "Understanding of Concept" for both males and females. The research was conducted on 100 respondents out of which 49 were males and 51 were females with no missing cases.

**SEX**

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | SEX | N | Percent | N | Percent | N | Percent |
| Understanding | Male | 49 | 100.0% | 0 | 0.0% | 49 | 100.0% |
| | Female | 51 | 100.0% | 0 | 0.0% | 51 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | SEX | Statistic | df | Sig. | Statistic | df | Sig. |
| Understanding | Male | .148 | 49 | .009 | .940 | 49 | .014 |
| | Female | .131 | 51 | .029 | .914 | 51 | .001 |

a. Lilliefors Significance Correction

Figure 23: Two Sample Test – Understanding the concept in Gender

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis. Mann-Whitney U test is used to do the further analysis to test whether there is difference in the understanding of concept between males and females.

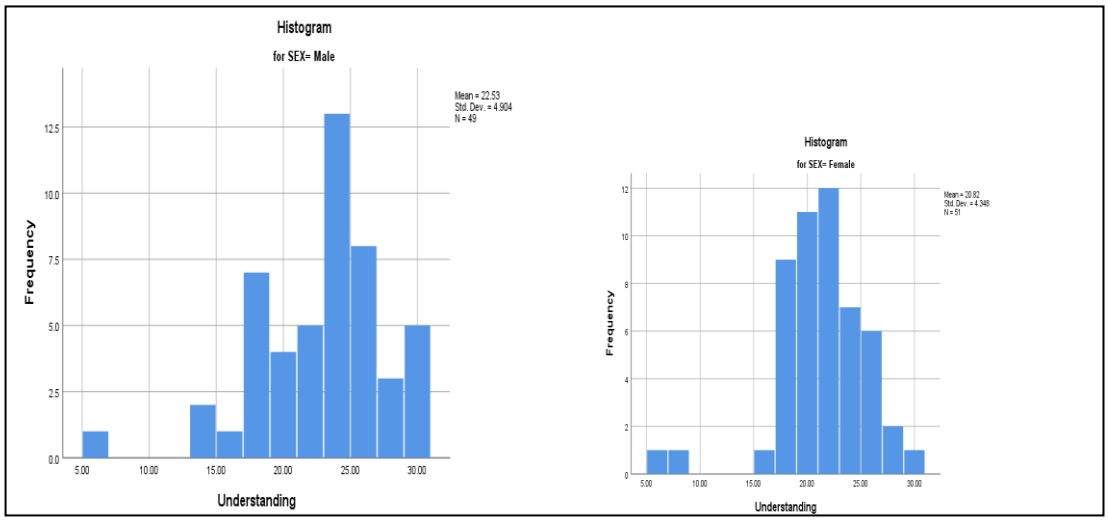



Figure 24: Histogram for males and females – Understanding the concepts

**Mann-Whitney Test**

**Ranks**

| | SEX | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Understanding | Male | 49 | 56.79 | 2782.50 |
| | Female | 51 | 44.46 | 2267.50 |
| | Total | 100 | | |

**Test Statistics[a]**

| | Understanding |
|---|---|
| Mann-Whitney U | 941.500 |
| Wilcoxon W | 2267.500 |
| Z | -2.132 |
| Asymp. Sig. (2-tailed) | .033 |

a. Grouping Variable: SEX

**Two-Sample Kolmogorov-Smirnov Test**

**Frequencies**

| | SEX | N |
|---|---|---|
| Understanding | Male | 49 |
| | Female | 51 |
| | Total | 100 |

**Test Statistics[a]**

| | | Understanding |
|---|---|---|
| Most Extreme Differences | Absolute | .295 |
| | Positive | .295 |
| | Negative | -.023 |
| Kolmogorov-Smirnov Z | | 1.476 |
| Asymp. Sig. (2-tailed) | | .026 |

a. Grouping Variable: SEX

Figure 25. Non Parametric Test for female and male -Understanding the concepts

The Figure shown above shows the results of the tests perfromed. As seen, the p-value achived for both the performed test is less than 0.05 which signifies that we can reject the null hyposthis stated. Thus, we can conclude that there is a statistically significant difference between males and females in terms of understanding of concept for Web-based Learning and Classroom Learning training approaches.

Thus, observing the mean values for Mann-Whitney Test we can determine that the male respondents opinion by observing the mean rank values which is 56.79 which states that E-learning has a better understanding of concepts over Classroom training learning approach whereas female respondents opinion states that there is no significant difference between the E-Learning and Classroom training approaches for the parameter understanding of concept.

### 4.3.2 Understanding of concept and Age:

The test for normality is conducted for the scale of "Understanding of Concept" for all the age groups. The research was conducted on 100 respondents out of which 69 belong to the age groups of 19-29, 25 belong to age group of 30-39, 4 belong to age group of 40-49 and 2 to age group of 50 and above with no missing cases.

**Tests of Normality**

| | AGE | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Understanding | 19 to 29 | .104 | 69 | .064 | .960 | 69 | .028 |
| | 30 to 39 | .166 | 25 | .074 | .892 | 25 | .013 |
| | 40 to 49 | .185 | 4 | . | .993 | 4 | .971 |
| | 50 above | .260 | 2 | . | | | |

a. Lilliefors Significance Correction

Figure 26. Normality Test for the parameter Age – Understanding the concepts

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the age groups in terms of performance parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the age groups for "Understanding of Concept" parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the age groups for "Understanding of Concept" parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter "Understanding of Concept" between the age groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | AGE | N | Mean Rank |
|---|---|---|---|
| Understanding | 19 to 29 | 69 | 51.33 |
| | 30 to 39 | 25 | 50.68 |
| | 40 to 49 | 4 | 37.75 |
| | 50 above | 2 | 45.00 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Understanding |
|---|---|
| Kruskal-Wallis H | .910 |
| df | 3 |
| Asymp. Sig. | .823 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Figure 27. Kruskal- Wallis Test for Age – Understanding the concepts

The above figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the age groups for "Understanding of Concept" parameter for Web-based Learning and Classroom Learning approaches.

### 4.3.3 Understanding of concept and Experience:

The test for normality is conducted for the scale of "Understanding of Concept" for all the Experience groups. The research was conducted on 100 respondents out of which 9 people have an experience of less than 1, 6 respondents have an experience of 1-2 years, 13 respondents have an experience of 2-3 years, 19 respondents have an experience of 3-4 years, 13 respondents have an experience of 4-5 years and 40 respondents have an experience of 5+ years with no missing cases

**Tests of Normality**

| | Experience | Kolmogorov-Smirnov[a] Statistic | df | Sig. | Shapiro-Wilk Statistic | df | Sig. |
|---|---|---|---|---|---|---|---|
| Understanding | Less than a year | .168 | 9 | .200* | .951 | 9 | .700 |
| | 1 year | .226 | 6 | .200* | .953 | 6 | .763 |
| | 2 years | .145 | 13 | .200* | .910 | 13 | .183 |
| | 3 years | .128 | 19 | .200* | .955 | 19 | .472 |
| | 4 years | .219 | 13 | .089 | .822 | 13 | .013 |
| | 5 years | .127 | 40 | .106 | .920 | 40 | .008 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 28. Normality Test for Experience – Understanding the concepts

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the Experience groups in terms of "Understanding of Concept" parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the Experience groups for "Understanding of Concept" parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the Experience groups for "Understanding of Concept" parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter "Understanding of Concept" between the Experience groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | Experience | N | Mean Rank |
|---|---|---|---|
| Understanding | Less than a year | 9 | 42.44 |
| | 1 year | 6 | 63.50 |
| | 2 years | 13 | 51.69 |
| | 3 years | 19 | 50.89 |
| | 4 years | 13 | 55.92 |
| | 5 years | 40 | 48.03 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Understanding |
|---|---|
| Kruskal-Wallis H | 2.691 |
| df | 5 |
| Asymp. Sig. | .748 |

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Figure 29. Kruskal- Wallis Test for Experience- Understanding the concepts

The figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the Experience groups for “Understanding of Concept” parameter for Web-based Learning and Classroom Learning approaches.

### 4.4 Analysis for Performance:

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning for the parameter performance.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning for the parameter performance.

As per the analysis done earlier, we have discussed that the variable "performance" is not normally distributed thus, we perform Nonparametric test.

**NPar Tests**

**One-Sample Kolmogorov-Smirnov Test**

| | | Performance |
|---|---|---|
| N | | 100 |
| Normal Parameters[a,b] | Mean | 25.6700 |
| | Std. Deviation | 6.17596 |
| Most Extreme Differences | Absolute | .127 |
| | Positive | .075 |
| | Negative | -.127 |
| Test Statistic | | .127 |
| Asymp. Sig. (2-tailed) | | .000[c] |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 30 : One sample Kolmogorov-Smirnov Test - Performance

The figure above shows the results for the performed one sample Kolmogorov-Smirnov Test. The results for the performance parameter depict a mean value of 25.67 for N of 100 samples. The p-value for the test is less the 0.05 thus, we reject the set null hypothesis. Thus, we can state that there is statistically significant difference between Web-based Learning and Classroom Learning for the parameter performance.

### 4.4.1 Performance and Sex:

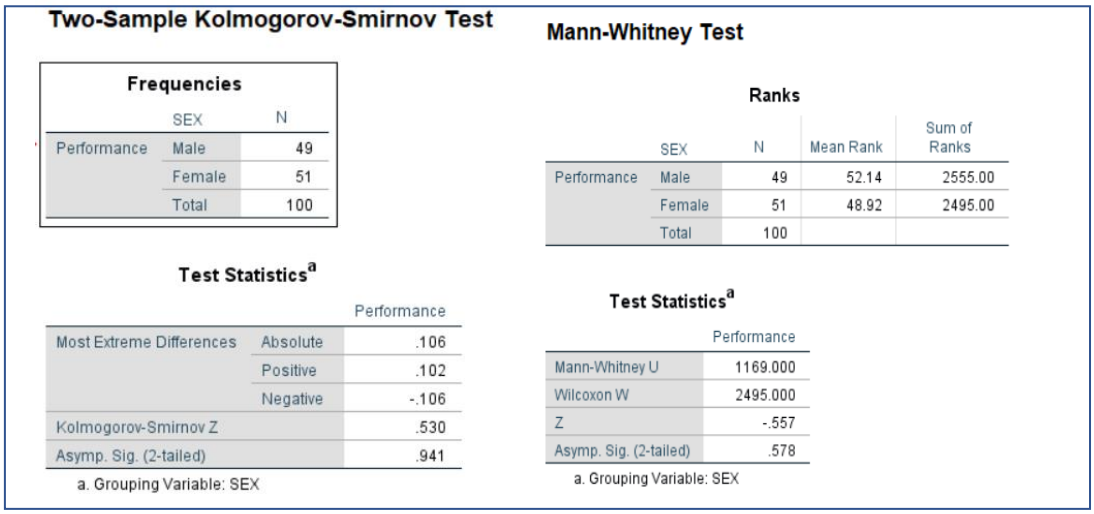
The test for normality is conducted for the scale of "Performance" for both males and females. The research was conducted on 100 respondents out of which 49 were males and 51 were females with no missing cases. The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the male's and female's opinion in terms of performance parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter performance.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter performance.

Two-Sample Kolmogorov-Smirnov Test and Mann-Whitney U test is performed to do the further analysis to test whether there is difference in the understanding of concept between males and females.



**Two-Sample Kolmogorov-Smirnov Test**

**Frequencies**

| | SEX | N |
|---|---|---|
| Performance | Male | 49 |
| | Female | 51 |
| | Total | 100 |

**Test Statistics[a]**

| | | Performance |
|---|---|---|
| Most Extreme Differences | Absolute | .106 |
| | Positive | .102 |
| | Negative | -.106 |
| Kolmogorov-Smirnov Z | | .530 |
| Asymp. Sig. (2-tailed) | | .941 |

a. Grouping Variable: SEX

**Mann-Whitney Test**

**Ranks**

| | SEX | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Performance | Male | 49 | 52.14 | 2555.00 |
| | Female | 51 | 48.92 | 2495.00 |
| | Total | 100 | | |

**Test Statistics[a]**

| | Performance |
|---|---|
| Mann-Whitney U | 1169.000 |
| Wilcoxon W | 2495.000 |
| Z | -.557 |
| Asymp. Sig. (2-tailed) | .578 |

a. Grouping Variable: SEX

Figure 31. Non Parametric Tests for Gender - Peformance

The figure shown above shows the results of the testes perfromed. As seen, the p-value achived for both the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between males and females in terms of performance for Web-based Learning and Classroom Learning training approaches.

### 4.4.2 Performance and Age:

The test for normality is conducted for the scale of "Performance" for all the age groups. The research was conducted on 100 respondents out of which 69 belong to the age groups of 19-29, 25 belong to age group of 30-39, 4 belong to age group of 40-49 and 2 to age group of 50 and above with no missing cases. The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the age groups in terms of performance parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the age groups for performance parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the age groups for performance parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter performance between the age groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | AGE | N | Mean Rank |
|---|---|---|---|
| Performance | 19 to 29 | 69 | 49.76 |
| | 30 to 39 | 25 | 54.76 |
| | 40 to 49 | 4 | 44.13 |
| | 50 above | 2 | 35.50 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Performance |
|---|---|
| Kruskal-Wallis H | 1.321 |
| df | 3 |
| Asymp. Sig. | .724 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Figure 32. Kruskal- Wallis Test for Age- Performance

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the age groups for performance parameter for Web-based Learning and Classroom Learning approaches.

### 4.4.3 Performance and Experience:

The test for normality is conducted for the scale of "Performance" for all the Experience groups. The research was conducted on 100 respondents out of which 9 people have an experience of less than 1, 6 respondents have an experience of 1-2 years, 13 respondents have an experience of 2-3 years, 19 respondents have an experience of 3-4 years, 13 respondents have an experience of 4-5 years and 40 respondents have an experience of 5+ years with no missing cases. The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the Experience groups in terms of performance parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the Experience groups for performance parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the Experience groups for performance parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter performance between the Experience groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | Experience | N | Mean Rank |
|---|---|---|---|
| Performance | Less than a year | 9 | 36.72 |
| | 1 year | 6 | 63.92 |
| | 2 years | 13 | 54.81 |
| | 3 years | 19 | 44.29 |
| | 4 years | 13 | 56.12 |
| | 5 years | 40 | 51.31 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Performance |
|---|---|
| Kruskal-Wallis H | 5.024 |
| df | 5 |
| Asymp. Sig. | .413 |

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Figure 33. Kruskal-Wallis Test for Experience- Performance

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the Experience groups for performance parameter for Web-based Learning and Classroom Learning approaches.

### 4.5 Time

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning for the parameter time.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning for the parameter time.

As per the analysis done earlier, we have discussed that the variable "time" is not normally distributed thus, we perform Nonparametric test.

**NPar Tests**

**One-Sample Kolmogorov-Smirnov Test**

| | | Time |
|---|---|---|
| N | | 100 |
| Normal Parameters[a,b] | Mean | 7.6400 |
| | Std. Deviation | 1.67886 |
| Most Extreme Differences | Absolute | .225 |
| | Positive | .155 |
| | Negative | -.225 |
| Test Statistic | | .225 |
| Asymp. Sig. (2-tailed) | | .000[c] |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 34. One sample Kolmogorov-Smirnov Test -Time

The figure above shows the results for the performed one sample Kolmogorov-Smirnov Test. The results for the time parameter depict a mean value of 7.64 for N of 100 samples and standard deviation of 1.67886. The p-value for the test is less the 0.05 thus, we reject the set null hypothesis. Thus, we can state that there is statistically significant difference between Web-based Learning and Classroom Learning for the parameter time.

### 4.5.1 Time and Sex:

The test for normality is conducted for the scale of "Time" for both males and females. The research was conducted on 100 respondents out of which 49 were males and 51 were females with no missing cases.

For the purpose of performing analysis for Time parameter agaisnt the sex. We perform analysis of distribution of the time parameter with respect to indiviual sex.

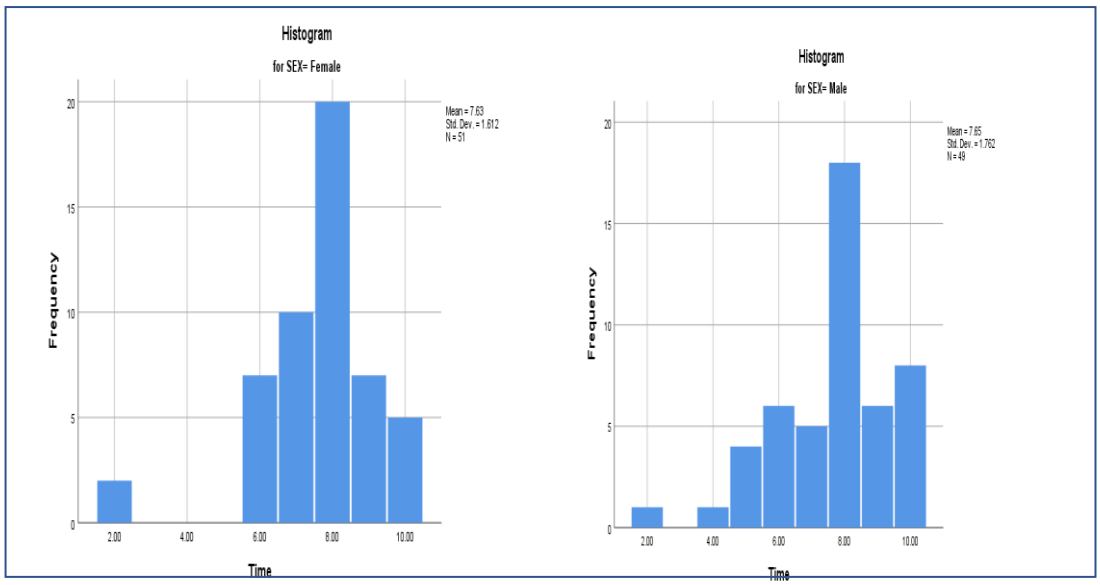



Figure 35. Histograms for male and female – Time

From the above figures we can visualize that the time parameter is not normally distributed over male and female data gathered.

**SEX**

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | SEX | N | Percent | N | Percent | N | Percent |
| Time | Male | 49 | 100.0% | 0 | 0.0% | 49 | 100.0% |
| | Female | 51 | 100.0% | 0 | 0.0% | 51 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | SEX | Statistic | df | Sig. | Statistic | df | Sig. |
| Time | Male | .231 | 49 | .000 | .909 | 49 | .001 |
| | Female | .219 | 51 | .000 | .839 | 51 | .000 |

a. Lilliefors Significance Correction

Figure 36. Kolmogorov-Smirnov and Shapiro-Wilk Test for Sex -Time

The above figure illustrates the results for the Kolmogorov-Smirnov and Shapiro-Wilk test are utilized for the normality checks, which state that as the significance value is

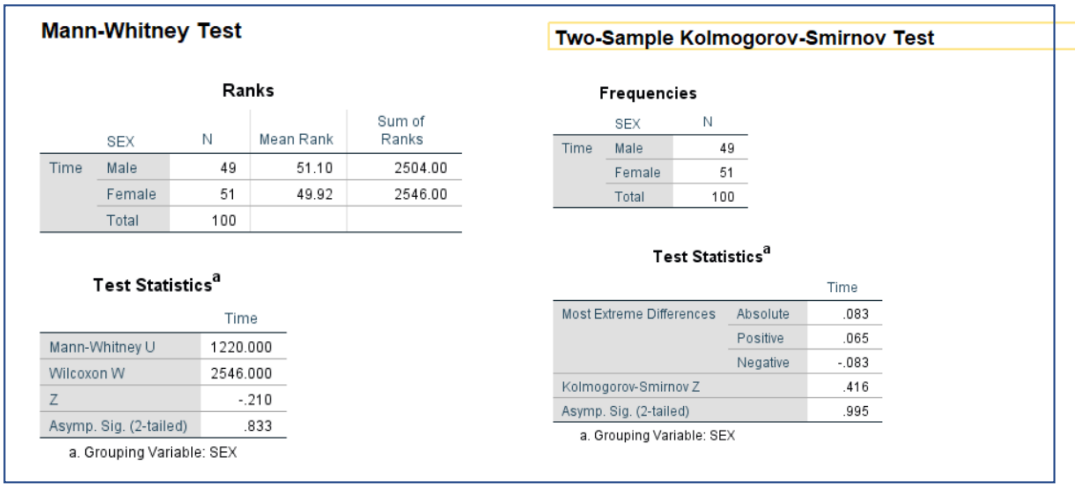
less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing male's and female's opinion in terms of time parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter time.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter time.

Two-Sample Kolmogorov-Smirnov Test and Mann-Whitney U test is performed to do the further analysis to test whether there is difference in the opinions between males and females in relationship to the E-learning and Classroom training approaches based on time parameter.



**Mann-Whitney Test**

**Ranks**

| | SEX | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Time | Male | 49 | 51.10 | 2504.00 |
| | Female | 51 | 49.92 | 2546.00 |
| | Total | 100 | | |

**Test Statistics[a]**

| | Time |
|---|---|
| Mann-Whitney U | 1220.000 |
| Wilcoxon W | 2546.000 |
| Z | -.210 |
| Asymp. Sig. (2-tailed) | .833 |

a. Grouping Variable: SEX

**Two-Sample Kolmogorov-Smirnov Test**

**Frequencies**

| | SEX | N |
|---|---|---|
| Time | Male | 49 |
| | Female | 51 |
| | Total | 100 |

**Test Statistics[a]**

| | | Time |
|---|---|---|
| Most Extreme Differences | Absolute | .083 |
| | Positive | .065 |
| | Negative | -.083 |
| Kolmogorov-Smirnov Z | | .416 |
| Asymp. Sig. (2-tailed) | | .995 |

a. Grouping Variable: SEX

Figure 37. Non Parametric Tests on Gender- Time

The Figure shown above shows the results of the testes perfromed. As seen, the p-value achived for both the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between males and females in terms of time for Web-based Learning and Classroom Learning training approaches.

### 4.5.2 Time and Age

The test for normality is conducted for the scale of "Time" for all the age groups. The research was conducted on 100 respondents out of which 69 belong to the age groups of 19-29, 25 belong to age group of 30-39, 4 belong to age group of 40-49 and 2 to age group of 50 and above with no missing cases.

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | AGE | N | Percent | N | Percent | N | Percent |
| Time | 19 to 29 | 69 | 100.0% | 0 | 0.0% | 69 | 100.0% |
| | 30 to 39 | 25 | 100.0% | 0 | 0.0% | 25 | 100.0% |
| | 40 to 49 | 4 | 100.0% | 0 | 0.0% | 4 | 100.0% |
| | 50 above | 2 | 100.0% | 0 | 0.0% | 2 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | AGE | Statistic | df | Sig. | Statistic | df | Sig. |
| Time | 19 to 29 | .190 | 69 | .000 | .921 | 69 | .000 |
| | 30 to 39 | .294 | 25 | .000 | .793 | 25 | .000 |
| | 40 to 49 | .441 | 4 | . | .630 | 4 | .001 |
| | 50 above | .260 | 2 | . | | | |

a. Lilliefors Significance Correction

Figure 38. The Kolmogorov-Smirnov and Shapiro-Wilk test Age and Time

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the age groups in terms of time parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the age groups for time parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the age groups for time parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter time between the age groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | AGE | N | Mean Rank |
|---|---|---|---|
| Time | 19 to 29 | 69 | 50.12 |
| | 30 to 39 | 25 | 53.58 |
| | 40 to 49 | 4 | 45.38 |
| | 50 above | 2 | 35.25 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Time |
|---|---|
| Kruskal-Wallis H | 1.038 |
| df | 3 |
| Asymp. Sig. | .792 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Figure 39. The Kruskal-Wallis test Age- Time

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the age groups for time parameter for Web-based Learning and Classroom Learning approaches.

### 4.5.3 Time and Experience:

The test for normality is conducted for the scale of "Time" for all the Experience groups. The research was conducted on 100 respondents out of which 9 people have an experience of less than 1, 6 respondents have an experience of 1-2 years, 13 respondents have an experience of 2-3 years, 19 respondents have an experience of 3-4 years, 13 respondents have an experience of 4-5 years and 40 respondents have an experience of 5+ years with no missing cases

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | Experience | N | Percent | N | Percent | N | Percent |
| Time | Less than a year | 9 | 100.0% | 0 | 0.0% | 9 | 100.0% |
| | 1 year | 6 | 100.0% | 0 | 0.0% | 6 | 100.0% |
| | 2 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 3 years | 19 | 100.0% | 0 | 0.0% | 19 | 100.0% |
| | 4 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 5 years | 40 | 100.0% | 0 | 0.0% | 40 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Experience | Statistic | df | Sig. | Statistic | df | Sig. |
| Time | Less than a year | .264 | 9 | .071 | .892 | 9 | .208 |
| | 1 year | .283 | 6 | .143 | .921 | 6 | .514 |
| | 2 years | .209 | 13 | .125 | .875 | 13 | .060 |
| | 3 years | .162 | 19 | .200* | .950 | 19 | .389 |
| | 4 years | .183 | 13 | .200* | .880 | 13 | .072 |
| | 5 years | .284 | 40 | .000 | .830 | 40 | .000 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 40 : The Kolmogorov-Smirnov and Shapiro-Wilk test-Time and Experience

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the Experience groups in terms of performance parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the Experience groups for time parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the Experience groups for time parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter performance between the Experience groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | Experience | N | Mean Rank |
|---|---|---|---|
| Time | Less than a year | 9 | 43.44 |
| | 1 year | 6 | 59.42 |
| | 2 years | 13 | 56.50 |
| | 3 years | 19 | 46.34 |
| | 4 years | 13 | 48.88 |
| | 5 years | 40 | 51.30 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Time |
|---|---|
| Kruskal-Wallis H | 2.263 |
| df | 5 |
| Asymp. Sig. | .812 |

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Figure 41. Kruskal-Wallis Test for Experience -Time

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the Experience groups for time parameter for Web-based Learning and Classroom Learning approaches.

### 4.6 Interaction:

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning for the parameter interaction.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning for the parameter interaction.

As per the analysis done earlier, we have discussed that the variable "interaction" is not normally distributed thus, we perform Nonparametric test.

**NPar Tests**

**One-Sample Kolmogorov-Smirnov Test**

| | | Interaction_1 |
|---|---|---|
| N | | 100 |
| Normal Parameters[a,b] | Mean | 3.4100 |
| | Std. Deviation | 1.21518 |
| Most Extreme Differences | Absolute | .236 |
| | Positive | .124 |
| | Negative | -.236 |
| Test Statistic | | .236 |
| Asymp. Sig. (2-tailed) | | .000[c] |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 42. Kolmogorov-Smirnov Test - Interaction

The figure above shows the results for the performed one sample Kolmogorov-Smirnov Test. The results for the performance parameter depict a mean value of 3.41 for N of 100 samples. The p-value for the test is less the 0.05 thus, we reject the set null hypothesis. Thus, we can state that there is statistically significant difference between Web-based Learning and Classroom Learning for the parameter interaction.

### 4.6.1 Interaction and Sex:

The test for normality is conducted for the scale of “Interaction” for both males and females. The research was conducted on 100 respondents out of which 49 were males and 51 were females with no missing cases.

For the purpose of performing analysis for Interaction parameter against sex. We perform analysis of distribution of the interaction parameter with respect to indiviual sex.

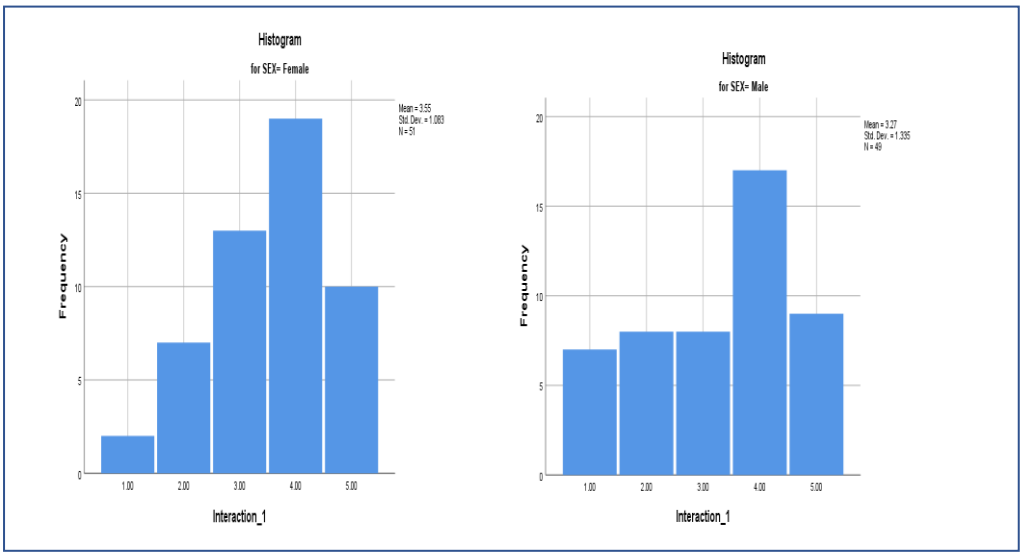



Figure 43. Histograms for male and female – Time

From the above figures we can visualize that the interaction parameter is not normally distributed over male and female data gathered.

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | SEX | N | Percent | N | Percent | N | Percent |
| Interaction_1 | Male | 49 | 100.0% | 0 | 0.0% | 49 | 100.0% |
| | Female | 51 | 100.0% | 0 | 0.0% | 51 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | SEX | Statistic | df | Sig. | Statistic | df | Sig. |
| Interaction_1 | Male | .240 | 49 | .000 | .882 | 49 | .000 |
| | Female | .230 | 51 | .000 | .896 | 51 | .000 |

a. Lilliefors Significance Correction

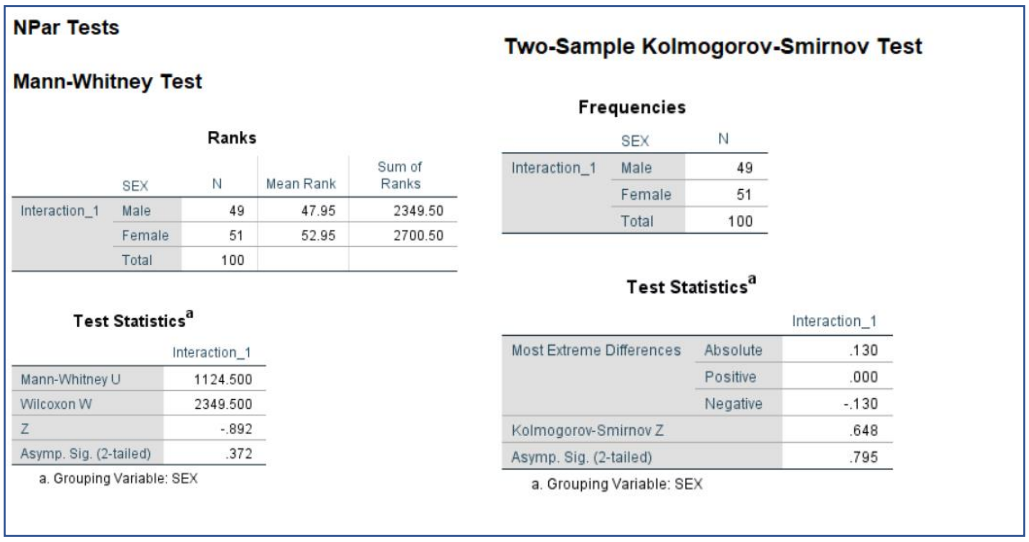
Figure 44. the Kolmogorov-Smirnov and Shapiro-Wilk test for Interaction and Gender

The above figure illustrates the results for the Kolmogorov-Smirnov and Shapiro-Wilk test are utilized for the normality checks, which states that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.
We perform nonparametric test for comparing male's and female's opinion in terms of interaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter interaction.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter interaction.

Two-Sample Kolmogorov-Smirnov Test and Mann-Whitney U test is performed to do further analysis to test whether there is difference in the understanding of concept between males and females.



**NPar Tests**

**Mann-Whitney Test**

**Ranks**

| | SEX | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Interaction_1 | Male | 49 | 47.95 | 2349.50 |
| | Female | 51 | 52.95 | 2700.50 |
| | Total | 100 | | |

**Test Statistics[a]**

| | Interaction_1 |
|---|---|
| Mann-Whitney U | 1124.500 |
| Wilcoxon W | 2349.500 |
| Z | -.892 |
| Asymp. Sig. (2-tailed) | .372 |

a. Grouping Variable: SEX

**Two-Sample Kolmogorov-Smirnov Test**

**Frequencies**

| | SEX | N |
|---|---|---|
| Interaction_1 | Male | 49 |
| | Female | 51 |
| | Total | 100 |

**Test Statistics[a]**

| | | Interaction_1 |
|---|---|---|
| Most Extreme Differences | Absolute | .130 |
| | Positive | .000 |
| | Negative | -.130 |
| Kolmogorov-Smirnov Z | | .648 |
| Asymp. Sig. (2-tailed) | | .795 |

a. Grouping Variable: SEX

Figure 45. Non -parametric Test – Gender and Interaction

The figure shown above shows the results of the tests performed. As seen, the p-value achived for both the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between males and females in terms of time for Web-based Learning and Classroom Learning training approaches.

### 4.6.2 Interaction and Age:

The test for normality is conducted for the scale of "Interaction" for all the age groups. The research was conducted on 100 respondents out of which 69 belong to the age groups of 19-29, 25 belong to age group of 30-39, 4 belong to age group of 40-49 and 2 to age group of 50 and above with no missing cases.

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | AGE | N | Percent | N | Percent | N | Percent |
| Interaction_1 | 19 to 29 | 69 | 100.0% | 0 | 0.0% | 69 | 100.0% |
| | 30 to 39 | 25 | 100.0% | 0 | 0.0% | 25 | 100.0% |
| | 40 to 49 | 4 | 100.0% | 0 | 0.0% | 4 | 100.0% |
| | 50 above | 2 | 100.0% | 0 | 0.0% | 2 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | AGE | Statistic | df | Sig. | Statistic | df | Sig. |
| Interaction_1 | 19 to 29 | .223 | 69 | .000 | .894 | 69 | .000 |
| | 30 to 39 | .272 | 25 | .000 | .876 | 25 | .006 |
| | 40 to 49 | .208 | 4 | . | .950 | 4 | .714 |
| | 50 above | .260 | 2 | . | | | |

Figure 46. the Kolmogorov-Smirnov and Shapiro-Wilk test for Age and Interaction

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the age groups in terms of interaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the age groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the age groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter interaction between the age groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | AGE | N | Mean Rank |
|---|---|---|---|
| Interaction_1 | 19 to 29 | 69 | 50.51 |
| | 30 to 39 | 25 | 51.60 |
| | 40 to 49 | 4 | 44.13 |
| | 50 above | 2 | 49.25 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Interaction_1 |
|---|---|
| Kruskal-Wallis H | .249 |
| df | 3 |
| Asymp. Sig. | .969 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Figure 47. Kruskal-Wallis Test – Interaction and Age

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the age groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

### 4.6.3 Interaction and Experience:

The test for normality is conducted for the scale of "Interaction" for all the Experience groups. The research was conducted on 100 respondents out of which 9 people have an experience of less than 1 year, 6 respondents have an experience of 1-2 years, 13 respondents have an experience of 2-3 years, 19 respondents have an experience of 3-4 years, 13 respondents have an experience of 4-5 years and 40 respondents have an experience of 5+ years with no missing cases.

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | Experience | N | Percent | N | Percent | N | Percent |
| Interaction_1 | Less than a year | 9 | 100.0% | 0 | 0.0% | 9 | 100.0% |
| | 1 year | 6 | 100.0% | 0 | 0.0% | 6 | 100.0% |
| | 2 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 3 years | 19 | 100.0% | 0 | 0.0% | 19 | 100.0% |
| | 4 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 5 years | 40 | 100.0% | 0 | 0.0% | 40 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Experience | Statistic | df | Sig. | Statistic | df | Sig. |
| Interaction_1 | Less than a year | .286 | 9 | .033 | .727 | 9 | .003 |
| | 1 year | .202 | 6 | .200* | .853 | 6 | .167 |
| | 2 years | .201 | 13 | .158 | .887 | 13 | .089 |
| | 3 years | .223 | 19 | .013 | .914 | 19 | .088 |
| | 4 years | .257 | 13 | .019 | .799 | 13 | .007 |
| | 5 years | .242 | 40 | .000 | .894 | 40 | .001 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 48. the Kolmogorov-Smirnov and Shapiro-Wilk test for Experience and Interaction

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the Experience groups in terms of interaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the Experience groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the Experience groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | Experience | N | Mean Rank |
|---|---|---|---|
| Interaction_1 | Less than a year | 9 | 39.67 |
| | 1 year | 6 | 63.17 |
| | 2 years | 13 | 44.08 |
| | 3 years | 19 | 49.92 |
| | 4 years | 13 | 60.69 |
| | 5 years | 40 | 50.09 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Interaction_1 |
|---|---|
| Kruskal-Wallis H | 4.989 |
| df | 5 |
| Asymp. Sig. | .417 |

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Figure 49. Kruskal-Wallis Test – Experience and Interaction

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the Experience groups for interaction parameter for Web-based Learning and Classroom Learning approaches.

### 4.7 Overall Satisfaction:

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning for the parameter Overall Satisfaction.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning for the parameter Overall Satisfaction.

As per the analysis done earlier, we have discussed that the variable “overall satisfaction” is not normally distributed thus, we perform Nonparametric test.

**NPar Tests**

**One-Sample Kolmogorov-Smirnov Test**

| | | Overall |
|---|---|---|
| N | | 100 |
| Normal Parameters[a,b] | Mean | 14.8500 |
| | Std. Deviation | 3.46228 |
| Most Extreme Differences | Absolute | .137 |
| | Positive | .120 |
| | Negative | -.137 |
| Test Statistic | | .137 |
| Asymp. Sig. (2-tailed) | | .000[c] |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 50. Kolmogorov-Smirnov Test – Overall Satisfaction

The figure above shows the results for the performed one sample Kolmogorov-Smirnov Test. The results for the performance parameter depict a mean value of 14.85 for N of 100 samples. The p-value for the test is less the 0.05 thus, we reject the set null hypothesis. Thus, we can state that there is statistically significant difference between Web-based Learning and Classroom Learning for the parameter overall satisfaction.

### 4.7.1 Overall Satisfaction and Sex: Interaction

The test for normality is conducted for the scale of "Overall Satisfaction" for both males and females. The research was conducted on 100 respondents out of which 49 were males and 51 were females with no missing cases.

For the purpose of performing analysis for Interaction parameter agaisnt the sex. We perform analysis of distribution of the interaction parameter with respect to indiviual sex.

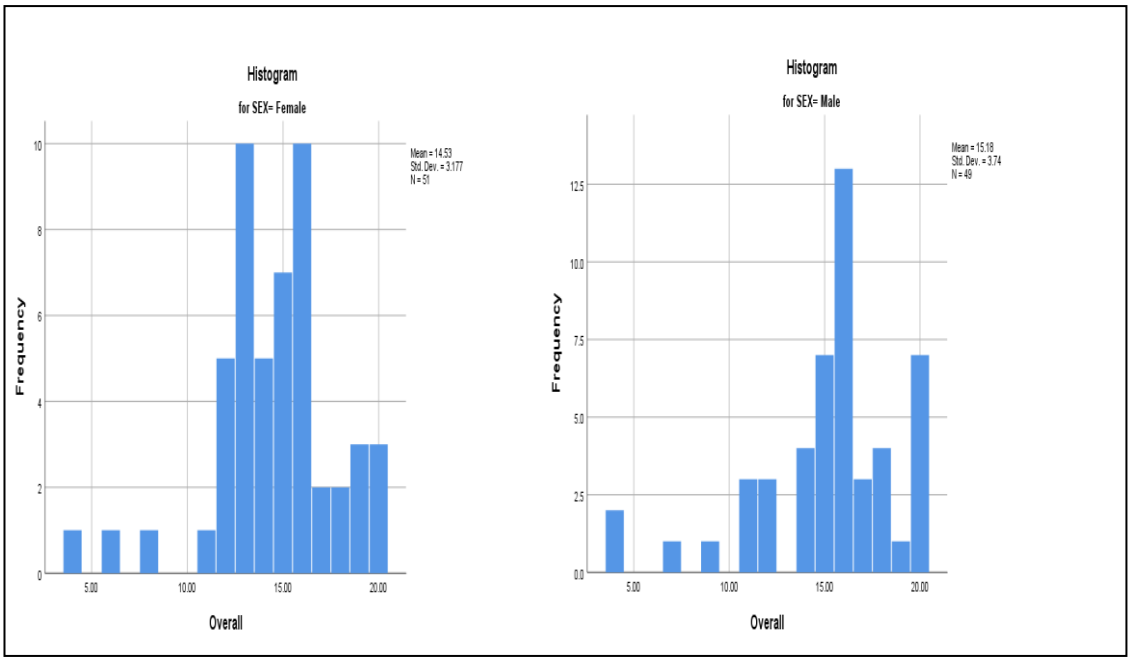



Figure 51. Histograms for male and female – Overall Satisfaction

From the above figures we can visualize that the interaction parameter is not normally distributed over male and female data gathered.

| **Case Processing Summary** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Cases | | | | | |
| | | Valid | | Missing | | Total | |
| | SEX | N | Percent | N | Percent | N | Percent |
| Overall | Male | 49 | 100.0% | 0 | 0.0% | 49 | 100.0% |
| | Female | 51 | 100.0% | 0 | 0.0% | 51 | 100.0% |

| **Tests of Normality** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | SEX | Statistic | df | Sig. | Statistic | df | Sig. |
| Overall | Male | .195 | 49 | .000 | .882 | 49 | .000 |
| | Female | .139 | 51 | .016 | .923 | 51 | .003 |
| a. Lilliefors Significance Correction | | | | | | | |

Figure 52. the Kolmogorov-Smirnov and Shapiro-Wilk test for Gender and Overall Satisfaction

The above figure illustrates the results for the Kolmogorov-Smirnov and Shapiro-Wilk test are utilized for the normality checks, which state that as the significance value is

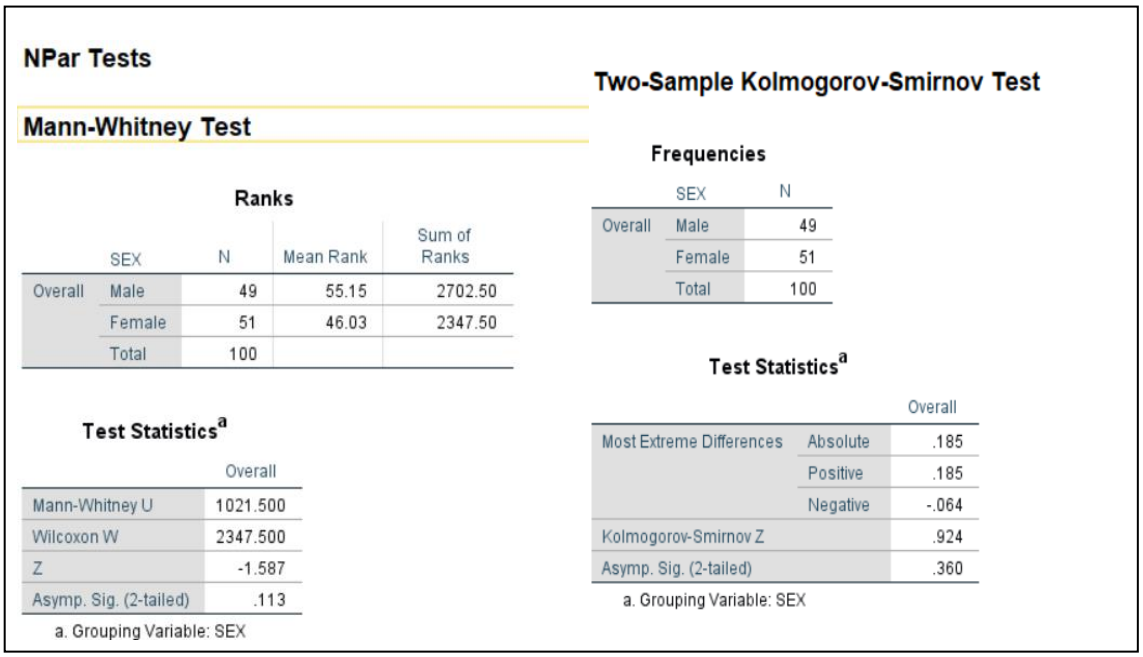
less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing male's and female's opinion in terms of overall satisfaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter overall satisfaction.

**Alternate Hypothesis**: There is statistically significant difference between Web-based Learning and Classroom Learning between males and females for the parameter overall satisfaction.

Two-Sample Kolmogorov-Smirnov Test and Mann-Whitney U test is performed to do the further analysis to test whether there is difference in the understanding of concept between males and females.



**NPar Tests**

**Mann-Whitney Test**

**Ranks**

| | SEX | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Overall | Male | 49 | 55.15 | 2702.50 |
| | Female | 51 | 46.03 | 2347.50 |
| | Total | 100 | | |

**Test Statistics[a]**

| | Overall |
|---|---|
| Mann-Whitney U | 1021.500 |
| Wilcoxon W | 2347.500 |
| Z | -1.587 |
| Asymp. Sig. (2-tailed) | .113 |

a. Grouping Variable: SEX

**Two-Sample Kolmogorov-Smirnov Test**

**Frequencies**

| | SEX | N |
|---|---|---|
| Overall | Male | 49 |
| | Female | 51 |
| | Total | 100 |

**Test Statistics[a]**

| | | Overall |
|---|---|---|
| Most Extreme Differences | Absolute | .185 |
| | Positive | .185 |
| | Negative | -.064 |
| Kolmogorov-Smirnov Z | | .924 |
| Asymp. Sig. (2-tailed) | | .360 |

a. Grouping Variable: SEX

Figure 53. Non -parametric Test – Gender and Overall Satisfaction

The Figure shown above shows the results of the tests perfromed. As seen, the p-value achived for both the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between males and females in terms of overall satisfaction for Web-based Learning and Classroom Learning training approaches.

### 4.7.2 Overall Satisfaction and Age:

The test for normality is conducted for the scale of "Performance" for all the age groups. The research was conducted on 100 respondents out of which 69 belong to the age groups of 19-29, 25 belong to age group of 30-39, 4 belong to age group of 40-49 and 2 to age group of 50 and above with no missing cases.

| **Case Processing Summary** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Cases | | | | | |
| | | Valid | | Missing | | Total | |
| | AGE | N | Percent | N | Percent | N | Percent |
| Overall | 19 to 29 | 69 | 100.0% | 0 | 0.0% | 69 | 100.0% |
| | 30 to 39 | 25 | 100.0% | 0 | 0.0% | 25 | 100.0% |
| | 40 to 49 | 4 | 100.0% | 0 | 0.0% | 4 | 100.0% |
| | 50 above | 2 | 100.0% | 0 | 0.0% | 2 | 100.0% |

| **Tests of Normality** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | AGE | Statistic | df | Sig. | Statistic | df | Sig. |
| Overall | 19 to 29 | .127 | 69 | .008 | .942 | 69 | .003 |
| | 30 to 39 | .169 | 25 | .064 | .888 | 25 | .010 |
| | 40 to 49 | .331 | 4 | . | .865 | 4 | .279 |
| | 50 above | .260 | 2 | . | | | |
| Lilliefors Significance Correction | | | | | | | |

Figure 54. the Kolmogorov-Smirnov and Shapiro-Wilk test for Age and Overall Satisfaction

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the age groups in terms of overall satisfaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the age groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the age groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter overall satisfaction between the age groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | AGE | N | Mean Rank |
|---|---|---|---|
| Overall | 19 to 29 | 69 | 50.49 |
| | 30 to 39 | 25 | 52.86 |
| | 40 to 49 | 4 | 41.25 |
| | 50 above | 2 | 39.75 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Overall |
|---|---|
| Kruskal-Wallis H | .863 |
| df | 3 |
| Asymp. Sig. | .834 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Figure 55. Kruskal-Wallis Test – Age and Overall Satisfaction

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the age groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

### 4.7.3 Overall Satisfaction and Experience:

The test for normality is conducted for the scale of "Overall Satisfaction" for all the Experience groups. The research was conducted on 100 respondents out of which 9 people have an experience of less than 1, 6 respondents have an experience of 1-2 years, 13 respondents have an experience of 2-3 years, 19 respondents have an experience of 3-4 years, 13 respondents have an experience of 4-5 years and 40 respondents have an experience of 5+ years with no missing cases

**Case Processing Summary**

| | | Cases | | | | | |
|---|---|---|---|---|---|---|---|
| | | Valid | | Missing | | Total | |
| | Experience | N | Percent | N | Percent | N | Percent |
| Overall | Less than a year | 9 | 100.0% | 0 | 0.0% | 9 | 100.0% |
| | 1 year | 6 | 100.0% | 0 | 0.0% | 6 | 100.0% |
| | 2 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 3 years | 19 | 100.0% | 0 | 0.0% | 19 | 100.0% |
| | 4 years | 13 | 100.0% | 0 | 0.0% | 13 | 100.0% |
| | 5 years | 40 | 100.0% | 0 | 0.0% | 40 | 100.0% |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Experience | Statistic | df | Sig. | Statistic | df | Sig. |
| Overall | Less than a year | .127 | 9 | .200* | .954 | 9 | .730 |
| | 1 year | .333 | 6 | .036 | .879 | 6 | .266 |
| | 2 years | .170 | 13 | .200* | .915 | 13 | .212 |
| | 3 years | .117 | 19 | .200* | .967 | 19 | .722 |
| | 4 years | .269 | 13 | .011 | .788 | 13 | .005 |
| | 5 years | .140 | 40 | .046 | .893 | 40 | .001 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 56. the Kolmogorov-Smirnov and Shapiro-Wilk test for Experience and Overall Satisfaction

The Kolmogorov-Smirnov and Shapiro-Wilk test are used for the normality checks, which state that as the significance value is less than 0.05 there is no normal distribution and therefore, we reject the null hypothesis.

We perform nonparametric test for comparing the opinion of all the Experience groups in terms of overall satisfaction parameter for Web based learning and Classroom training.

**Null Hypothesis**: There is no statistically significant difference between the Experience groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

**Alternate Hypothesis**: There is a statistically significant difference between the Experience groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

N-pair Kolmogorov-Smirnov Test is performed to do the further analysis to test whether there is difference for the parameter overall satisfaction between the Experience groups.

**NPar Tests**

**Kruskal-Wallis Test**

**Ranks**

| | Experience | N | Mean Rank |
|---|---|---|---|
| Overall | Less than a year | 9 | 37.83 |
| | 1 year | 6 | 62.33 |
| | 2 years | 13 | 54.96 |
| | 3 years | 19 | 48.55 |
| | 4 years | 13 | 54.46 |
| | 5 years | 40 | 49.76 |
| | Total | 100 | |

**Test Statistics[a,b]**

| | Overall |
|---|---|
| Kruskal-Wallis H | 3.439 |
| df | 5 |
| Asymp. Sig. | .633 |

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Figure 57. Kruskal-Wallis Test – Experience and Overall Satisfaction

The Figure shown above shows the results of the Kruskal-Wallis test perfromed. As seen, the p-value achived for the performed test is greater the 0.05 which signifies that we cannot reject the null hyposthis stated. Thus, we can conclude that there is no statistically significant difference between the Experience groups for overall satisfaction parameter for Web-based Learning and Classroom Learning approaches.

### 4.8 Linear Regression for Performance as dependent Variable:

The method that we have used in this research is Enter Method using Linear Regression. For the purpose of this we consider "performance" as a dependent variable. The independent variables considered are "understanding", "interaction", "time" and "overall satisfaction". In order to check which of the independent variables has an effect on the performance parameter, we conduct linear regression analysis.

After conducting the required steps, a significant linear regression was found ($F(4,95) = 1382.886$, $p<.000$) with R square of 0.469.

A linear regression was calculated to predict the transactional leadership of an employee in a retail sector based on transformational leadership style of the leader in the retail sector. A significant linear regression was found ($F(7,96) = 139.69$, $p<.000$) with R square of 0.924. To understand the contribution of each of the coefficients we form the following linear regression equation:

*Performance = -1.650 + 0.379(Time) + .401(Interaction) + .657(Understanding) + 0.614(Overall)*

The value of the performance variable is thus increased each time based on the standardized co-efficient values.

| Variables Entered/Removed[a] | | | |
|---|---|---|---|
| Model | Variables Entered | Variables Removed | Method |
| 1 | Understanding, Interaction_1, Time, Overall[b] | . | Enter |
| a. Dependent Variable: Performance | | | |
| b. All requested variables entered. | | | |

| Model Summary[b] | | | | |
|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .924[a] | .854 | .848 | 2.40717 |
| a. Predictors: (Constant), Understanding, Interaction_1, Time, Overall | | | | |
| b. Dependent Variable: Performance | | | | |

| ANOVA[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 3225.635 | 4 | 806.409 | 139.169 | .000[b] |
| | Residual | 550.475 | 95 | 5.794 | | |
| | Total | 3776.110 | 99 | | | |
| a. Dependent Variable: Performance | | | | | | |
| b. Predictors: (Constant), Understanding, Interaction_1, Time, Overall | | | | | | |

| Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -1.650 | 1.237 | | -1.334 | .185 |
| | Time | .379 | .211 | .103 | 1.797 | .076 |
| | Interaction_1 | .401 | .242 | .079 | 1.656 | .101 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Overall | .657 | .147 | .368 | 4.467 | .000 |
| | Understanding | .614 | .103 | .466 | 5.956 | .000 |
| a. Dependent Variable: Performance | | | | | | |

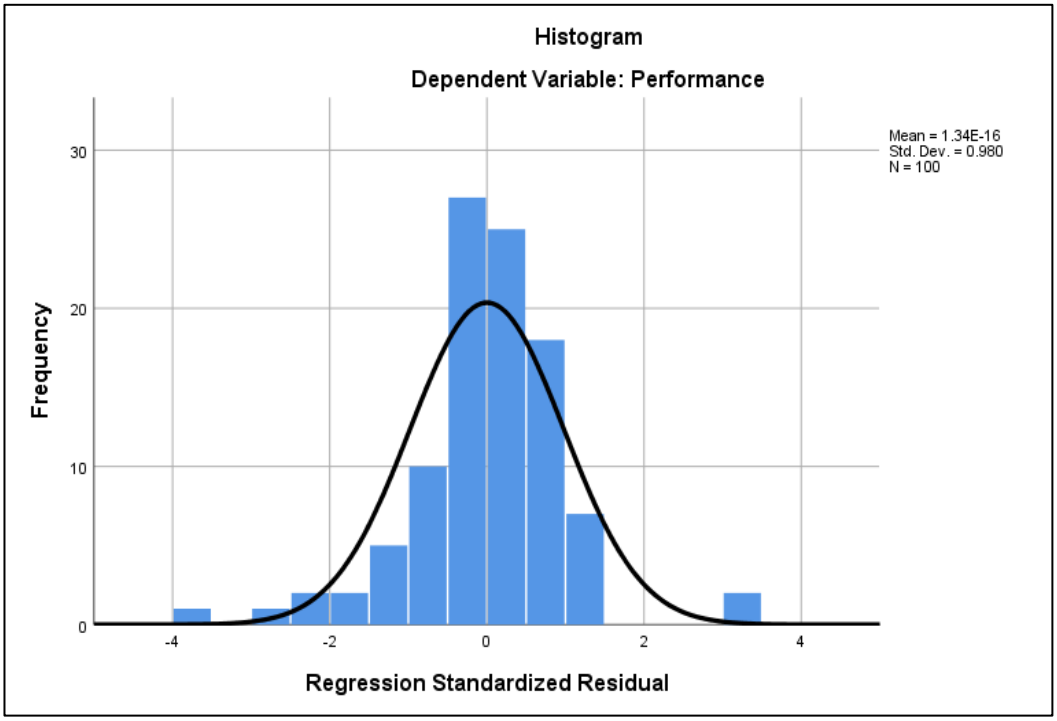



Figure 58. Histogram for Regression Standardized Residual for Performance

## 5 . Conclusion

The performed data analysis over the gathered questionnaire data reveals different insight in terms of respondent's opinions over the e-learning and classroom training approach. The results of the tests reveal that the overall population leans towards stating that e-learning approach to be more effective than classroom training for all the parameters (Understanding of concept, Time, Interaction, Performance and Overall Satisfaction) under consideration for the purpose of research.

In depth analysis performed for various demographics in order to understand if there exists any difference between the opinions of different groups considered for the purpose of this research reveals that there exists a difference in opinion for males and females for the parameter "Understanding of Concepts". The data reveals that female respondent's opinions states that there is no significant difference between the e-learning and classroom training approaches for the parameter understanding of concept. Whereas the male respondent's opinion by observing the mean rank values for Man Whitney U test which was 56.79 which stated that e-learning has a better understanding of concepts over classroom training learning approach. Further data analysis revealed that there was no difference in the opinion among any other group based on different on the two parameters: age and experience considered in this research. Thus, the data reveals that e-Learning approach of training could be considered to be more effective than classroom based training based on the five parameters (Understanding of concept, Time, Interaction, Performance and Overall Satisfaction) considered in this research. In order to understand the relationship among the parameters considered we have performed Linear regression considering Performance parameter as our target variable. The data reveals that the performance of an individual is highly correlated to understanding of concept and overall satisfaction achieved during the training being undertaken.

## 6. Recommendations

From the conclusion , two main points can be deduced. Firstly, the employees in the IT sector in India are more inclined towards the e-learning training approach. Secondly, the two parameters, understanding the concepts and overall experience have an significant impact on the performance of the employee. Considering these points, a few recommendations are presented below.

### Recommendations for Human Resource Development Team

- Set the objectives : Before introducing the any training in the organisation, it is advisable that the HRD teams sets out clear objective of introducing the training in the organisation via emails or e-brochures. Additionally, the training module should contain a slide where the objectives are clearly mentioned. This gives a set the background of the training and the tone of the training.
- Define the role of the trainer : Despite of the training being an e-learning module, the trainer can play a role of an information provider to a facilitator. It is advisable that the trainer play a role of facilitator as it boosts the involvement of the trainee in the training.
- Time : E-learning modules can vary in time. While some trainings are for 30-40 minutes , there are certain modules which stretch for hours. It is advisable that the training does not exceed the half an hour as studies suggest that an continuous attention span of an individual is of 40 minutes. The individual tends to get saturated with excess information after 40-42 minutes.
- Cost : The costs involved in developing an e-learning training module abides by the economic scale. These costs involves using the latest technology, maintenance cost, cost of content creation. Considering these parameters, the minimum cost of developing an e-learning module of an hour cost $8,000 approximately. However, these costs vary according to content and the number of hours (Howard and Schechter, 2009). Hence, it is advisable that organisations hire instructional designers and equip them with the necessary tools to develop an effective training program according to the need to the organisation.

Moving ahead, as the data indicates that understanding the concepts and overall satisfaction are the two parameters have a direct impact on the employee performance, below are the recommendations for instructional designers to create an effective training.

### Recommendation of Instructional Designers

- Appropriate use of images : Right images aid in retaining the information fives times more than normal. Hence, it is advisable to use photographs which gives a professional touch to the module. A series of pictures is more preferable than a bullet list.

- Appropriate breakup of the content : In order to achieve the objectives, it must be ensured to content of the e-learning module is arranged in a sequential order. Excess information should be avoided.
- Gamification : It is vital to use interactive activities as the boost in participation of the trainee.

## 7. Personal Learning Statement

### Why did I choose this topic ?

The domain of Learning and Development has always been the topic of my interest. Working for almost three years in a very renowned IT organisation in India, I had several opportunities to attend different trainings on several topics. While some of them were mandatory, attending the rest of them was by choice. The mandatory ones were mostly about the rules and policies of the organisation , the voluntary ones included a wide range topics such as Managing the clock , Problem Solving and Decision Making, Exceling at Excel and many more. While attending these, I came across the fact that the trainers used numerous training delivery approaches. While some of them were classroom training and some were e-learning modules. However, there was a drastic difference in the comprehension levels respectively. These series of events turned out to be the primary reason for choosing the topic.

### How has writing this dissertation helped me ?

After I finished writing the conclusion, I took day to reflect upon the entire journey of writing this dissertation. I realised that writing dissertation has a significant impact not only on my knowledge about the HRM topic, but also on certain life skills.

To begin with, I would like to discuss about the knowledge gain. Writing this dissertation was opportunity to explore the topic in depth and analyse the subtle nuance that have a huge impact of the effectiveness of the training delivery approaches. I stumbled upon numerous books and journals which talk about trainings and their impacts. Reading these reports and opinions of numerous authors gave me a range insights on this topic. I was motivated to read a lot of literature in order to link the topics. On technical side, I got an opportunity to compare between numerous statistical tools and choose the best one for the study. Consequently, I read a book on SPSS and the chose the relevant test to derive the best results. I often remember myself

As mentioned above, I observed a few changes in my skills after completing this piece of work. Firstly, I learnt the importance of time and planning and organising things. I observed myself resetting my priorities and creating an agenda for the day. I would give myself small goals to achieve ( For e.g. to complete a certain section or achieve the word count). Additionally, I found myself frequently running to the questionnaire to check the number of responses received. However, over a period of time I found myself controlling this anxiety which I consider as an improvement in the self-confidence. Sending out reminders to people to get the response and encouraging them helped me improve my patience. I still had to be polite despite of the rage of fury. I realised the professional and personal connections are of vital importance which form the nervous system of HRM.

## 7. References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## 9. Appendices

### 9.1 Appendix 1 – Confidentiality and Consent form

Dear Participant ,

Thank you for taking out time to participate in this survey. I am a Master's student at the National College Of Ireland currently pursuing a degree in Human Resource Management. This survey forms the backbone of my thesis.

The aim of this research is to analyse the significant difference between the effectiveness of the two training delivery methods approaches: classroom training and e-learning training in it Information Technology industry in India.

All the data collected will be kept completely confidential and safe. It would be strictly used ONLY for academic purpose. All the responses will be stored in a password protected Excel sheet which will be accessed only by me, the researcher and my supervisor.

Additionally, all the answers are anonymous and will in no way reveal your identity. You can opt-out of the survey anytime. All answers will be stored in a safe place for 1 year after the thesis is submitted according to the NCI data storage guideline.

Please feel free to contact me on the email address mentioned below for any questions and concerns.

Warm Regards

Aditi Kulkarni
x17170575@student.ncirl.ie

## 9.2 Appendix 2 – Demographic questions

What is your age group? *

- 19 to 29
- 29 to 39
- 39 to 49
- 50 and above

What is your gender ? *

- Female
- Male
- Prefer not to say
- Other...

How frequently do you attend training ? *

- Never
- Occasionally
- Sometimes
- Often
- Always

Have you ever taken up an e-Learning training module ? *

- Yes
- No

## 9.3 Appendix 3 – Likert Scale questions

If your answer is yes, could you please answer the questions below. I assure it will take you only 5 to 7 minutes.

Given below are a number sentences regarding your experience of e-learning training . Please read each one and indicate to what extent agree or disagree with each sentence. (1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree , 5= Strongly Agree)

Name of the e-Learning Training module (Optional)

Short answer text

The e-learning training module gave me proper insights on the subject matter than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strong Agree |

The e-learning training module had a good mix of theory and practice than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training module had opportunities for interactive learning compared to classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training module helped me gain a clear understanding of the subject than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The information presented in the e-learning training module was clear compared to classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training was arranged in a clear and logical way than classroom training *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

I feel confident about the knowledge I gained on the subject during the e-learning training module compared to classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

In comparison to classroom training, the e-learning training module reflected current practices used in the industry. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

In comparison to the classroom training, the e-learning training module focused on the relevant skills that I require for my job. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

To a large extent , the e-learning training module was relevant to my present job. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

There were clear takeaways from the e-learning training module than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Compared to classroom training, the e-learning training module helped me develop innovative ideas and implement them. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training module encouraged the growth and development of my skills than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

In comparison to classroom training, the time allotted for the e-learning training module was sufficient. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training module was delivered at a comfortable pace than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

In the e-learning training, the instructor was available via email or online discussion. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

I missed the direct, in -person interaction with other students in the e-learning training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The e-learning training module was delivered at a comfortable pace than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

In the e-learning training, the instructor was available via email or online discussion. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

I missed the direct, in -person interaction with other students in the e-learning training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

I missed the direct, in-person interaction with the trainer in the e-learning training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Compared to classroom training, the e-learning training module was effective in terms of improving my performance at work *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Compared to classroom training, the objectives of the e-learning training were clearly defined. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

The course content in the e-learning training met my expectations as compared to classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

I enjoyed attending the e-learning training course than classroom training. *

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Based on the experience, would you take another e-learning course ? *

- ○ Yes
- ○ No
- ○ Maybe

## Thank you for valuable feedback !

If you have any queries or concerns , please do not hesitate contact me at x17170575@student.ncirl.ie