IMPACT ASSESSMENT STUDY
OF
DIGITAL SAKSHARTA ABHIYAN

Submitted to:

CSC e-Governance Services India Ltd.

Ministry of Communications and Information Technology

Government of India

Submitted by:

Centre for Innovations in Public Systems

(An Autonomous Body of the Government of India)

College Park Campus of ASCI, Road No. 3, Banjara Hills, Hyderabad - 500 034, Telangana, India

Ph: 040-66720720, Fax: 040-66720721

IMPACT ASSESSMENT STUDY

OF

DIGITAL SAKSHARTA ABHIYAN

Submitted to:

CSC e-Governance Services India Ltd.

Ministry of Communications and Information Technology

Government of India

Submitted by:

Centre for Innovations in Public Systems

(An Autonomous Body of the Government of India)

College Park Campus of ASCI, Road No. 3,

Banjara Hills, Hyderabad - 500 034, Telangana, India

Ph: 040-66720720, Fax: 040-66720721

Contents

Acknowledgement

At the outset, the study team under the leadership of Dr. Nivedita P. Haran, IAS (Retd.), Director of the Centre for Innovations in Public Systems (CIPS), is grateful to the CSC e-Governance Services India Ltd., Ministry of Communications & Information Technology, Govt. of India, for awarding the cited study to CIPS.

The CIPS team wishes to express its sincere gratitude to Dr. Dinesh Kumar Tyagi, *IAS*, Chief Executive Officer of the CSC e-Governance Services India Ltd., Shri. J. Rajakishore, Assistant Vice President of the CSC e-Governance Services India Ltd, Ms. Surbhi Sharma, Assistant Manager of the CSC e-Governance Services India Ltd. and to other members. Without their unstinted encouragement, support, suggestions and liberal help, the study would not have been a success. They readily accepted the requests of varied nature from the study team at various stages of the assessment. They extended due guidance, offered valuable suggestions on fine-tuning the study focus, helped in the review of the research instruments.

The study team is also thankful to the beneficiaries from different States of the country for sharing data and inputs and lending due support for the conduct of the survey. Thanks are also due from the study team to the Village Level Entrepreneurs (VLEs) who extended due cooperation for the conduct of the survey and also willingly shared their views, opinions, concerns, suggestions and ideas.

Finally, the study team acknowledges the support it received from various officials at CIPS for the smooth and successful conduct of the study.

Executive Summary

An "Impact Assessment Study of the Digital Saksharta Abhiyan under National Digital Literacy Mission" was initiated in November 2016 by Centre for Innovations in Public Systems (CIPS), Hyderabad, Telangana with the sponsorship of the Common Service Centre e-Governance Services India Ltd. Ministry of Communications and Information Technology, Govt. of India. A framework was developed for this study which outlines a methodology for impact assessment, provides the rationale for the methodology and presents the results of assessment of impact of the training provided by CSC e-Governance Services India Ltd. to various respondents from rural corners across the country.

The framework proposed in the report was used to assess the impact of the training programme provided by the CSC e-Governance Services India Ltd., Ministry of Communications and Information Technology, Government of India. The proposed framework focuses on the idea of measuring the digital literacy of different respondents and takes a balanced approach to perform both quantitative and qualitative analysis. It recognizes that some part of the responses received for each respondent are quantitative while other parts need to be assessed qualitatively. The training programme was analyzed by designing an online structured questionnaire and collecting data from the respondents through telephonic survey. The framework aims to measure the impact and understand processes that can explain the nature and quantum of impact. It also identifies the possible shortcomings which when corrected can increase the efficacy of any similar programme in future.

The framework was used to make detailed assessments of six mature wide scope sub-sections representing different types of information pertaining to the training programme conducted. The sections are – Socio-economic background of the trainee, Computer skills, Mobile usage, Technology awareness, Training logistics and Overall impact. The assessment involved a

systematic survey of the respondents conducted by CIPS in a professional manner. A sample of 50,000 beneficiaries from 30 States have been selected from the pool of 5,74,975 at the rate of approximately nine percent of the data received for each State. The data pertained to beneficiaries who have undergone the training programme and received certificate. However, the mentioned rate is under achieved for the states of Kerala, Karnataka and Maharashtra. It was informed that in the case of Kerala, the state already had a digital literacy programme and districts that the state wished to cover, faced lack of connectivity. This led to lower number of certified beneficiaries while conducting the telephonic survey. For the other two states, the number of beneficiaries surveyed is lower than the targeted level because many of the trainees had not been issued the certificate when the telephonic survey was conducted due to the absence of Aadhar card which is mandatory for writing the exam and getting the certificate.

The data from 50,000 selected respondents from 30 States was collected systematically. The states were categorized to six zones, viz., North, South, East, West, Central and North-East. The responses clearly encapsulated the experience of respondents with the use of the technology, computer and mobile as well as with the infrastructure and impact of the training. The telephonic survey covered 43 questions grouped under 6 sections on which impact was being assessed. The responses for each section was analyzed and statistical significance of the difference was evaluated.

Study results show that respondents who have undergone the training programme have indicated an overwhelming positive improvement of the training programme in their digital literacy. Their preference is backed with the identification of areas where concrete benefits have accrued to them. Awareness levels, engagement levels with governance, ease of communication and levels of empowerment seem to have improved with the programme.

A composite score which could be compared across the States was computed from a rating of each question on a list of several common attributes. Respondents were also asked to rank the attributes based on a scale. Using user assigned importance to different attributes, a weighted composite score was calculated for each zone. The difference in the composite score among the zones indicate the degree of perceived impact.

There is considerable variability in the composite scores (represents an overall assessment) across six zones. In general, these ratings substantiate well with the data collected through an independent set of questions. The approach of assessing impact on different respondents, using multiple dimensions and a mix of direct and indirect measurements stands validated. The methodology produces an assessment which enables a ranking of the States within a particular zone and the ranking of the zones according to the degree of overall perceived impact. This can be equated to a measure of success. The analysis can provide a basis for go-no-go decisions in initiating similar training programmes.

Limitations of the study

The study was exploratory in nature. While the difference between the sample size and the population size is found to be statistically significant, selection of a larger sample size would have ensured greater accuracy in terms of analysis of the data for the respondents.

The overall impact of the training programme should be seen in the context of the five sections of the questionnaire that was designed for impact analysis. Keeping in mind the wide reach and scope of activities of the training programme, it would be hasty to generalize the overall conclusions of impact assessment from this study. More insights need to be drawn from a larger sample to generalize the conclusions.

The primary objective of the study was to measure the impact of the training programme on the digital literacy of the respondents. Further studies need to be undertaken to explain the variation in impact on various dimensions, viz., and difference across locations for the same training programme. Studies could also be undertaken to understand the effectiveness of different delivery models and implementation modalities such as the use of public private partnerships. More data (quantitative as well as qualitative) will need to be collected to undertake such studies.

Section I gives a brief background about the Digital India programme. Section II presents a brief overview of the DISHA project and explains the context and objective of the study. This section also provides a snapshot of each of the 30 States on the responses that have been collected from the respondents. Section III describes the research methodology in terms of data collection, preparation of an online questionnaire, collection of data and specifies the tools and techniques used for the study. In Section IV, frequency distribution tables have been prepared for all the six zones on each of the question specified in the questionnaire. Section V presents a comparative analysis both for the zones and within the zones for specific dimensions. This section also covers the impact of the training programme on the beneficiaries in terms of using digital devices and analyses a broader impact on the society. Section VI brings out the challenges faced during the study and Section VII briefly states the possible way forward.

Recommendations

In spite of the few shortcomings noticed, the DISHA programme has reached out to a sizable number of persons from the young and middle-age groups and has provided basic familiarity with digital technology. The participation of women, almost on a 50:50 basis is truly heartening. In general, and specifically in certain states, the DISHA programme has had a

perceptible positive impact. Based on the data analysis certain specific suggestions can be made to recommend modifications or improvements in future. Apart from drawing out the factors that could help make the programme more efficacious, it also acts as a beacon for future guidance. The suggestions and recommendations are divided into Short Term and Long Term.

Short Term

1. Need for Aadhar-seeding may be a necessary condition for the enrolment into the training programme.
2. The CSC and/or VLE may be required to hand-hold the applicant to obtain an Aadhar card, thereby making the training enrolment a conduit for Aadhar inclusion.
3. Providing a personal mobile number during enrolment need not be mandatory as applicants, especially female applicants, are wary about disclosing their mobile numbers, as these can be misused. Some other mode may be devised to verify trainees' identity.
4. Future programmes that aim at digital literacy need to target the rural areas and small towns more determinedly than the cosmopolitan areas.
5. Future programmes should link into curriculum the computer courses in high schools (Class 8 to 12). This will provide a natural link between the elders attending such training with the youngsters (often children and the grand kids) from the same households.
6. Wider usage of open source software is also strongly recommended. Lessons from states that have done well in this respect may be replicated.

7. The curriculum needs to have more hands-on experience, especially in online money transfer, e-Wallets, e-Banking, e-Mailing, managing digital locker and digital signature, etc.
8. There needs to be higher accountability of the CSC/VLE. This will ensure weeding out of the fly-by-night operators who take up the work only to make a fast buck.
9. For this reason and to encourage local entrepreneurship, the training work may be assigned to the educated youth from the same or surrounding panchayats.
10. Women SHGs may also be encouraged to take up training work as CSC/VLE. This will encourage more women to opt for the training programme.
11. The study came across such anomaly where illiterate persons were desirous of attaining digital literacy. It is, therefore, recommended that future digital literacy programmes may also provide the option of a minimum hours of literacy lessons (40 hours). By doing so large swathes of adult illiterates in some parts of the country can become literate.
12. The CSCs may maintain a master list of all those with digital proficiency in that village or panchayat. Those without digital literacy can seek the help of such persons from the master list on payment basis. This would be a win-win for all.
13. An Interactive Voice Response (IVR) system can be designed during the training to collect the data from the beneficiaries in order to assess the impact of the training programme. Measurement instruments may be translated into local languages of the regions where the training programme is implemented.
14. An attempt can be made to quantify the cost incurred of accessing the training programme. The cost can be calculated as the number of trips made to a centre to complete the training programme being offered multiplied by the cost of making each

trip. Wage loss incurred due to travel time and waiting time can also be calculated. This can help gauge the cost-effectiveness of the training programme.

Long term

India as a country is one of the fastest growing economies with two-third of the population in the below 30 age group. In order to make the best use of the demographic dividend, it is necessary to ensure universal primary literacy coupled with digital literacy. However, the quality of education being below par with high drop-out rates, there are a large number of children who get access neither to primary schooling, nor digital education. Most of these children are from the most vulnerable and economically weaker families, migrant families, Adivasi families and urban slum dwellers.

To make the digital literacy programme genuinely successful and effective, such vulnerable children should not be allowed to fall through the crack. A targeted effort is needed to reach out to such children. The high level of inequalities – economic and social – often fails to reach those below the bottom of the pyramid since they are unseen and unheard. At the same time these children will grow up in a digital world that demands digital proficiency. Hence the following long–term suggestions have been put forward:

1. Future digital literacy programmes need to maintain a closer supervision on the VLEs to prevent the possibility of fraud and misuse.
2. A provision for mid-programme review to detect any aberrations before it is too late would make the programme more cost-effective. Based on the response, mid-term corrections can be made. This will make the trainees more engaged and keep the VLEs alert.
3. There is need to conduct a base line study on the digital profile of the population and digital aspirations. The study can help identify the population that is disinterested and

skeptical about digital technology and is 60 years plus; Government or other programmes need not, at least in the first instance, target this group. At the other end of the spectrum are the digital enthusiasts, who fiendishly learn up the latest technology regardless of training programmes. Finally, the group in the middle who range from the inquisitive to indifferent; this is the group to be targeted, Government may commission a study urgently to gather digital-proclivity of India's population.

4. Such a study as mentioned above would be of interest not only to policy makers but also to the corporate world as such a study would provide them with a fairly accurate picture of the profile, demands, needs and propensities of their target group(s).

I. Background

Digital India programme is one of the flagship schemes of the Government of India which envisages to transform the country into a digitally empowered society and a knowledge economy. The prime motive of this intervention is to give a facelift to the entire ecosystem of public services through effective usage of information technology.

The 3 key vision areas of the programme being:

- Digital Infrastructure as a core utility to every citizen
- Governance and services on demand
- Digital Empowerment of citizens

This is an umbrella programme which cuts across multiple Government Ministries/ Departments. A whole lot of ideas and thoughts are woven together with a comprehensive vision, so that each one of them can be implemented as a part of a larger goal. This is to be implemented by the Government as a whole for which the Ministry of Electronics and Information Technology (MeitY) is the facilitator.

Digital India is intended to provide the much-needed thrust to the 9 pillars of growth areas, they being:

1. Broadband Highways
2. Universal Access to Mobile Connectivity
3. Public Internet Access Programme
4. e-Governance: Reforming Government through Technology
5. e-Kranti - Electronic Delivery of Services
6. Information for All
7. Electronics Manufacturing

8. IT for Jobs
9. Early Harvest Programmes

"We want to have one mission and one target: Take the nation forward- Digitally, and Economically"

- Narendra Modi, Prime Minister of India

'One person in every household should be Digitally Literate', this is one of the major components of Hon. Prime Ministers' vision of Digital India.

In line with these 3 vision areas and 9 pillars, the Ministry of Electronics and Information Technology (MeitY), Govt. of India has come up with an idea of making at least a person from each household Digitally Literate. To achieve this, Common Service Centre (CSC) e-Governance Services India Ltd had been entrusted to drive Digital Saksharta Abhiyan (DISHA).

II. Introduction

2.1. Overview of the DISHA Project

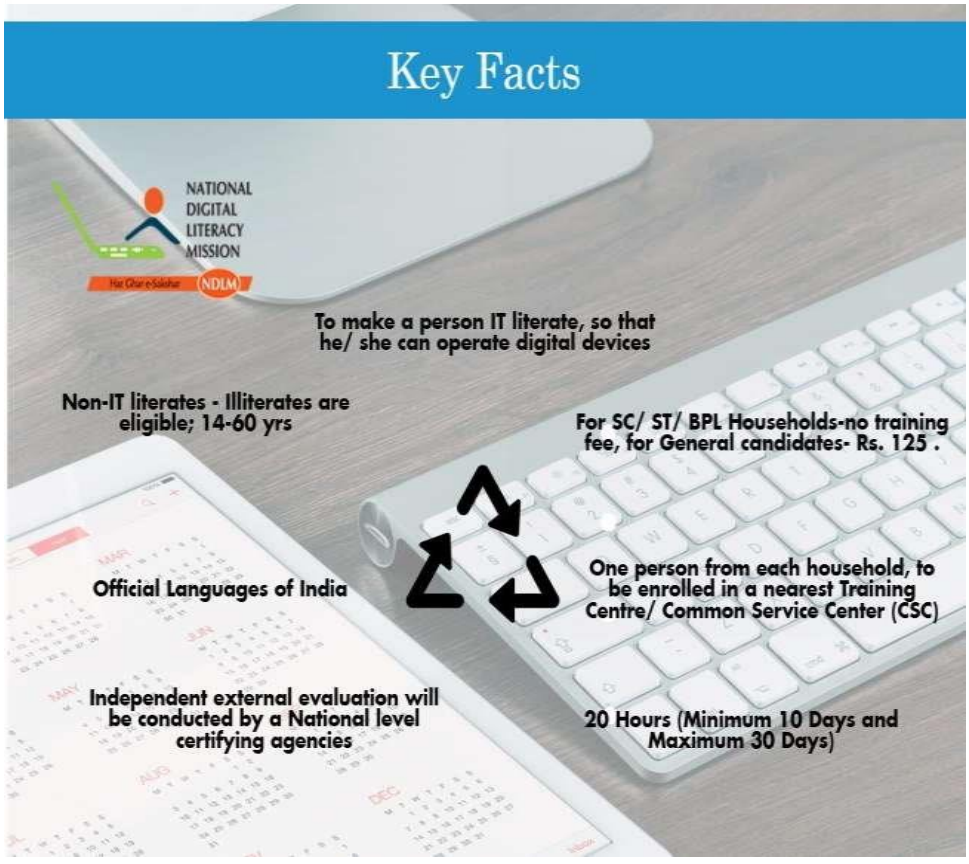
"Digital Literacy is the ability of individuals and communities to understand and use digital technologies for meaningful actions within life situations"

The Digital Saksharta Abhiyan (DISHA) or National Digital Literacy Mission (NDLM) Scheme has been devised in the year 2014 to provide IT training to non-IT literate citizens in the community through programmatic intervention. In a move to fulfill this mission, DISHA underscores the active and effective participation of people in the democratic and developmental process and enhance their livelihood.

In this context, Ministry of Communications and Information Technology, Govt. of India in collaboration with the Common Service Centre (CSC) e-Governance Services India Ltd., Govt. of India began to train people in every eligible household in selected blocks in each State/UT in order to enable them to use IT and related applications.

Under this scheme, altogether 52.5 lakh persons, including Anganwadi and ASHA workers and authorized ration dealers, have been trained in all the States/UTs across the country. The mission of DISHA has been to make the citizens IT literate so as to enable them to actively and effectively participate in the democratic and developmental process and also enhance their livelihood.


Digital Saksharta Abhiyan (DISHA)
NATIONAL DIGITAL LITERACY MISSION
Digital India
Power To Empower
Ministry of Electronics and Information Technology
Government of India
DIGITAL LITERACY IS THE ABILITY OF INDIVIDUALS AND COMMUNITIES TO UNDERSTAND AND USE DIGITAL TECHNOLOGIES FOR MEANINGFUL ACTIONS WITHIN LIFE SITUATIONS
1,959
TRAINING PARTNERS
1,00,09,961
ENROLLED FOR TRAINING
82,74,834
TRAINED CANDIDATES
53,37,456
CERTIFIED CANDIDATES


Key Facts
NATIONAL DIGITAL LITERACY MISSION
To make a person IT literate, so that he/ she can operate digital devices
Non-IT literates - Illiterates are eligible; 14-60 yrs
For SC/ ST/ BPL Households-no training fee, for General candidates- Rs. 125 .
Official Languages of India
One person from each household, to be enrolled in a nearest Training Centre/ Common Service Center (CSC)
Independent external evaluation will be conducted by a National level certifying agencies
20 Hours (Minimum 10 Days and Maximum 30 Days)

2.2. Objectives of the Study

The study was carried out for 50,000 beneficiaries of the DISHA project covering 30 States/UTs across the country. The specific objectives of the study are as follows:

- To outline each of the DISHA/NDLM interventions
- To collect quantitative data on the impact of the training programme on the beneficiaries
- To gather qualitative information on the community benefits from the training programme
- To record impact of the training process, levels of training, assessment process on the beneficiaries
- To document the present status of the beneficiaries who underwent the training process

III. Research Methodology

3.1. Data Collection

The study is based on the analysis of secondary data only. A dataset of 5,74,975 beneficiaries, covering thirty States, have been shared by the CSC e-Governance Services India Ltd., Ministry of Electronics & Information Technology (MeitY), Govt. of India. To carry out the impact assessment study, a representative sample of 51,748 respondents was drawn from 30 States stratified according to the number of districts for each State. The method of Simple Random Sampling has been followed for selection of sample size. However, a total of 50,159 responses were received.

Table – 1

Sl. No.	State	Total Given Data	Sample Size (@ 9% of total given data)	Response received	Completion Percentage
1	Andhra Pradesh	3509	315.81	318	9.06
2	Arunachal Pradesh	1823	164.07	172	9.43
3	Assam	400	36	36	9
4	Bihar	135128	12161.52	12174	9.01
5	Chandigarh	972	87.48	90	9.26
6	Chhattisgarh	2622	235.98	236	9
7	Delhi	327	29.43	30	9.17
8	Goa	98	8.82	10	10.20
9	Gujarat	7199	647.91	751	10.43
10	Haryana	2889	260.01	289	10.00
11	Himachal Pradesh	2834	255.06	269	9.49
12	Jammu & Kashmir	1903	171.27	179	9.41
13	Jharkhand	1977	177.93	180	9.10
14	Karnataka	69915	6292.35	5546	7.93
15	Kerala	265	23.85	9	3.40

Sl. No.	State	Total Given Data	Sample Size (@ 9% of total given data)	Response received	Completion Percentage
16	Madhya Pradesh	86640	7797.6	7841	9.05
17	Maharashtra	40510	3645.9	2357	5.82
18	Manipur	8220	739.8	740	9.00
19	Mizoram	1311	117.99	135	10.30
20	Nagaland	2763	248.67	261	9.45
21	Odisha	401	36.09	38	9.48
22	Puducherry	104	9.36	12	11.54
23	Punjab	16237	1461.33	1464	9.02
24	Rajasthan	101313	9118.17	9134	9.01
25	Sikkim	2038	183.42	184	9.03
26	Tamil Nadu	53110	4779.9	4920	9.26
27	Telangana	3046	274.14	276	9.06
28	Uttar Pradesh	4992	449.28	455	9.11
29	Uttarakhand	18117	1630.53	1632	9.01
30	West Bengal	4312	388.08	425	9.86
Total		**574975**	**51747.75**	**50163**	**8.72**

Source: Secondary Data, 2017

The study was conducted by a team of experts of Centre for Innovations in Public Systems (CIPS), Hyderabad. The following methodologies were adopted:

- Review of the existing data of the beneficiaries available with CSC, Govt. of India
- Selection of 50,000 beneficiaries through Simple Random Sampling
- Preparation of questionnaire covering various heads viz. quality of service, quality of governance, overall satisfaction and perception of e-Governance based exposure to different govt. services, impact on work, efficiency, effectiveness etc.
- Focused telephonic discussion with each of the selected beneficiary to quantify qualitative changes

- Creation of an online repository to record the telephonic discussions
- Data Collection, Data Feeding, Data Cleaning, Data Analysis using statistical package (SAS) & Data Interpretation
- Identification of areas for further scope of improvements
- Recommendations and Suggestions
- Documentation

A representative sample of 50,000 respondents was drawn across the country and it was ensured that States/UTs are proportionally represented.

3.2. Preparation of an Online Questionnaire

An illustrative questionnaire was prepared and used for telephonic survey based on the learning acquired during the process of impact assessment. The investigators were trained to understand the nature of the survey, focus of the study and an interpretation of individual items in the questionnaire.

The questionnaire is broadly categorized under six heads:

A. Details of the Trainee – Basic personal details of the beneficiary were cross verified with the data furnished by CSC e-Government Services India Ltd. Some details viz. profession/qualification, purpose of attending the training were also recorded.
B. Computer – This section intends to test the basic computer skills of the individual.
C. Mobile – This section intends to test the basic mobile usage skills of the individual. It primarily focuses on the usage of smart phone, accessing Wi-Fi services, making video calls etc. among others.

D. Technology – This analyses individual's ability to utilize technology for some meaningful purposes. Also, this enables to understand the individual's ease in reading/writing emails, accessing social networking platforms etc. among others.

E. Training – Basic infrastructure facilities, effectiveness and efficacy of the training is assessed here.

F. Impact – This is one of the crucial parts in the questionnaire. This covers the personal and social impact with respect to the individual's perspective.

Based on the analysis of the results obtained, presented below is a table which gives an idea about the ranking of the states on each of the section on the basis of which the impact of the training programme on the beneficiary has been assessed:

3.3. Order of the States

Table – 2: Order of the States in Computer Awareness

Order	Owning a Computer	Computer Usage
1	Bihar	Haryana
2	Rajasthan	Arunachal Pradesh
3	Kerala	Mizoram
4	Manipur	Bihar
5	Punjab	J&K
6	Sikkim	Puducherry
7	Karnataka	Kerala
8	Haryana	Manipur
9	Uttarakhand	Uttarakhand
10	Arunachal Pradesh	Punjab
11	Mizoram Nagaland	Rajasthan

Order	Owning a Computer	Computer Usage
12	Odisha Chhattisgarh	Chandigarh
13	J&K Uttar Pradesh	Sikkim
14	Chandigarh Telangana	Assam
15	Puducherry Assam	West Bengal
16	Gujarat	Goa
17	Delhi	Karnataka
18	Goa	Maharashtra
19	H.P	Chhattisgarh
20	West Bengal	Delhi
21	Madhya Pradesh	Tamil Nadu
22	Maharashtra	Andhra Pradesh
23	Andhra Pradesh Tamil Nadu	Telangana
24	Jharkhand	Odisha
25		Gujarat
26		Uttar Pradesh
27		Nagaland
28		Jharkhand
29		H.P
30		Madhya Pradesh

Table – 3: Order of the States in Mobile Awareness

Order	Type of device	Connecting Wi-Fi	Making video calls	Using a mobile phone	Performing balance enquiry
1	West Bengal	Haryana	Arunachal Pradesh	Haryana Punjab Delhi Chandigarh Andhra Pradesh Kerala Puducherry Jharkhand Odisha Goa Mizoram	Haryana Himachal Pradesh Rajasthan Chandigarh Andhra Pradesh Kerala Jharkhand Odisha Goa Gujarat Mizoram Nagaland Sikkim Chhattisgarh Madhya Pradesh
2	Uttar Pradesh Sikkim	J&K	Jharkhand	Himachal Pradesh	J&K Punjab Bihar Maharashtra Uttar Pradesh
3	Odisha Manipur	Chandigarh	Mizoram	J&K	Arunachal Pradesh
4	J&K	Jharkhand	J&K	Arunachal Pradesh	Karnataka
5	Karnataka	Mizoram	Chandigarh	Rajasthan	Telangana
6	Kerala Gujarat	Arunachal Pradesh	Andhra Pradesh	Madhya Pradesh	Manipur
7	Uttarakhand	Andhra Pradesh	Goa	Uttarakhand	Uttarakhand
8	Chhattisgarh	Goa	Madhya Pradesh	Bihar Gujarat Manipur	Delhi
9	Nagaland	Madhya Pradesh	Maharashtra	Telangana Chhattisgarh	Assam
10	Maharashtra	Telangana	Telangana	Maharashtra	Puducherry
11	Punjab	Maharashtra	Kerala	Karnataka	West Bengal
12	Puducherry	Kerala	Punjab	Sikkim	Tamil Nadu
13	Telangana	Punjab	Uttar Pradesh	West Bengal	
14	H.P Rajasthan	Gujarat	Rajasthan	Uttar Pradesh	
15	Delhi Bihar	Bihar	Bihar	Assam	

Order	Type of device	Connecting Wi-Fi	Making video calls	Using a mobile phone	Performing balance enquiry
16	Chandigarh	Rajasthan	Gujarat	Tamil Nadu	
17	Assam	Nagaland	Nagaland	Nagaland	
18	Arunachal Pradesh	Delhi	Manipur		
19	Mizoram	Odisha	Haryana		
20	Madhya Pradesh	Uttar Pradesh	Karnataka		
21	Jharkhand	H.P	Odisha		
22	Andhra Pradesh	Puducherry	Uttarakhand		
23	Goa	Assam	H.P		
24	Tamil Nadu	Uttarakhand	Puducherry		
25		Tamil Nadu	Delhi		
26		Manipur	Tamil Nadu		
27		Karnataka	Assam		
28		Chhattisgarh	Chhattisgarh		
29		Sikkim	West Bengal		
30		West Bengal	Sikkim		

Table – 4: Order of the States in Technology Awareness

Order	Having an eMail Id	e-Mail Proficiency	Purposes of using Technology	Accessing social networking Sites	Reporting a grievance
1	Goa	Goa	Mizoram	Goa	Manipur
2	Haryana	Odisha	Maharashtra	J&K	Tamil Nadu
3	Andhra Pradesh Bihar	Bihar Haryana	Sikkim	Haryana	Chandigarh
4	Odisha	Chandigarh Madhya Pradesh	Bihar	Mizoram Jharkhand	Maharashtra
5	Karnataka	Maharashtra	Uttarakhand	Andhra Pradesh	Rajasthan
6	Chandigarh	Karnataka	Assam	Chandigarh	Bihar
7	Maharashtra	Mizoram	Nagaland	Arunachal Pradesh	Karnataka
8	Punjab	Kerala	J&K	Maharashtra	Goa
9	Mizoram	Uttar Pradesh	Chhattisgarh	Madhya Pradesh	Andhra Pradesh
10	Kerala	Telangana	Uttar Pradesh	Telangana	Uttar Pradesh
11	Telangana	Rajasthan	Arunachal Pradesh	Punjab	Uttarakhand
12	Madhya Pradesh	H.P	Puducherry	H.P	Telangana
13	Rajasthan	Punjab Andhra Pradesh	Manipur	Gujarat	Kerala
14	Uttar Pradesh	Manipur	Telangana	Uttar Pradesh	West Bengal
15	Delhi Manipur	Gujarat	Karnataka	Nagaland	Mizoram
16	Himachal Pradesh Gujarat	Puducherry	Rajasthan	Bihar	Nagaland
17	West Bengal	Delhi	Punjab	Delhi Kerala	Chhattisgarh
18	Chhattisgarh	Tamil Nadu	Odisha	Rajasthan Puducherry	Madhya Pradesh
19	Puducherry Jharkhand	West Bengal	Delhi	Manipur	Punjab Haryana

Order	Having an eMail Id	e-Mail Proficiency	Purposes of using Technology	Accessing social networking Sites	Reporting a grievance
20	Nagaland	Chhattisgarh	Madhya Pradesh	Assam	J&K
21	Uttarakhand Arunachal Pradesh	Uttarakhand	Gujarat	Uttarakhand	H.P
22	J&K	Sikkim	West Bengal	Odisha	Arunachal Pradesh
23	Sikkim	Nagaland	Chandigarh	Tamil Nadu	Gujarat
24	Assam	Arunachal Pradesh	H.P	Chhattisgarh	Delhi
25	Tamil Nadu	J&K	Andhra Pradesh	Karnataka	Puducherry
26		Jharkhand	Goa	West Bengal	Jharkhand
27		Assam	Jharkhand	Sikkim	Odisha
28			Tamil Nadu		Assam
29			Haryana		Sikkim
30			Kerala		

Table – 5: Order of the States in Training Logistics

Order	Availability of computers	Periodic assessments	Nature of assessment	Power supply	Internet facility	Trainer responsiveness	Hands on training session
1	Uttar Pradesh	Andhra Pradesh Kerala Goa Maharashtra Mizoram Nagaland	Kerala Goa	Haryana Punjab Delhi Andhra Pradesh Karnataka Kerala Jharkhand Odisha Goa Gujarat Maharashtra Nagaland Sikkim Chhattisgarh Madhya Pradesh	Goa Gujarat Jharkhand Andhra Pradesh Kerala Haryana Delhi Chandigarh	Haryana H.P J&K Punjab Delhi Chandigarh Andhra Pradesh Kerala Jharkhand Goa Gujarat Madhya Pradesh	Mizoram Goa Jharkhand Andhra Pradesh Kerala Haryana Punjab Delhi Chandigarh
2	Puducherry	Chandigarh	Mizoram	H.P	Maharashtra	Maharashtra	Maharashtra
3	Odisha	Assam	Chandigarh	Arunachal Pradesh	Mizoram	Mizoram	Arunachal Pradesh
4	H.P Madhya Pradesh	Arunachal Pradesh	Haryana	Mizoram	J&K	Arunachal Pradesh	J&K
5	Gujarat	J&K	Andhra Pradesh	J&K	Arunachal Pradesh	Bihar Chhattisgarh	H.P
6	Karnataka	Jharkhand	Maharashtra	Chandigarh Bihar	Bihar	Odisha Sikkim Uttar Pradesh	Gujarat Bihar
7	Jharkhand Sikkim	Bihar Chhattisgarh	Madhya Pradesh	Assam Uttar Pradesh	Madhya Pradesh Uttar Pradesh Odisha	Telangana	Madhya Pradesh Odisha
8	West Bengal	Haryana	Puducherry	Telangana	Telangana	Rajasthan	Uttar Pradesh
9	Chhattisgarh	Sikkim	Jharkhand	Rajasthan	Rajasthan	West Bengal Assam	Telangana
10	Nagaland	Puducherry Madhya Pradesh	Telangana Arunachal Pradesh	Uttarakhand	Karnataka Punjab	Nagaland	Rajasthan

Order	Availability of computers	Periodic assessments	Nature of assessment	Power supply	Internet facility	Trainer responsiveness	Hands on training session
11	Delhi Uttarakhand	Rajasthan Karnataka Uttar Pradesh	Uttar Pradesh	Puducherry	West Bengal	Karnataka	Karnataka
12	Manipur Mizoram	Uttarakhand	Delhi	West Bengal	Puducherry	Uttarakhand	Nagaland
13	Maharashtra	Telangana	Punjab	Manipur	Nagaland H.P	Manipur	Assam
14	Rajasthan	Manipur	Nagaland	Tamil Nadu	Sikkim	Puducherry	Sikkim
15	Bihar	Punjab	Bihar		Manipur	Tamil Nadu	Puducherry
16	Punjab Assam	Delhi	Rajasthan		Uttarakhand		Chhattisgarh
17	Telangana	West Bengal	Karnataka		Chhattisgarh		West Bengal
18	Chandigarh	H.P Odisha	H.P		Tamil Nadu		Manipur
19	Tamil Nadu	Gujarat	Manipur		Assam		Uttarakhand
20	Kerala	Tamil Nadu	Tamil Nadu Gujarat				Tamil Nadu
21	Arunachal Pradesh		Uttarakhand				
22	Haryana		Odisha				
23	Goa		West Bengal				
24	Andhra Pradesh		J&K				
25	J&K		Sikkim				
26			Chhattisgarh				
27			Assam				

Table – 6: Order of the States in Impact

Order	Using digital devices	Accessing website(s)/ portal(s)	Educating Others	Recommending the training	Difficulties faced
1	J&K Arunachal Pradesh	Mizoram	Mizoram	Kerala	Punjab Delhi Chandigarh Andhra Pradesh Kerala Jharkhand Odisha Goa Gujarat Mizoram
2	Mizoram	Chandigarh	J&K	Mizoram	Haryana Maharashtra
3	Andhra Pradesh	Haryana	Arunachal Pradesh	J&K	H.P
4	Chandigarh	Andhra Pradesh	Andhra Pradesh	Arunachal Pradesh	J&K Madhya Pradesh
5	Goa	Goa	Goa	Andhra Pradesh	Arunachal Pradesh
6	Haryana	J&K	Haryana Chandigarh	Goa	Bihar
7	Maharashtra	Maharashtra	Kerala	Haryana	Uttar Pradesh
8	Jharkhand	Jharkhand	Maharashtra	Chandigarh	Uttarakhand
9	Kerala	Kerala	Jharkhand	Maharashtra	West Bengal Nagaland
10	Madhya Pradesh	Nagaland	Nagaland	Nagaland	Tamil Nadu
11	Rajasthan Bihar	Puducherry	Assam	Jharkhand	Puducherry
12	Puducherry	Assam	Puducherry	Telangana	Rajasthan
13	Telangana Delhi	Rajasthan	Tamil Nadu	Uttar Pradesh	Karnataka Telangana
14	Tamil Nadu Nagaland	Madhya Pradesh	Madhya Pradesh	Assam	Sikkim
15	Gujarat	Bihar	Rajasthan Delhi	Rajasthan	Manipur
16	Uttar Pradesh	Punjab	Bihar	Bihar Puducherry	Assam
17	Punjab	Telangana	Telangana	Gujarat	Chhattisgarh
18	Manipur Uttarakhand	Tamil Nadu	Gujarat	Madhya Pradesh	

Order	Using digital devices	Accessing website(s)/ portal(s)	Educating Others	Recommending the training	Difficulties faced
19	Odisha	Delhi	Manipur	Delhi	
20	Assam	Manipur	Punjab	Tamil Nadu	
21	Karnataka	Gujarat	Odisha	Uttarakhand	
22	West Bengal	Uttarakhand	Uttarakhand	Punjab	
23	H.P	H.P	Chhattisgarh	Chhattisgarh Sikkim	
24	Sikkim Chhattisgarh	Odisha	Sikkim	Manipur	
25		West Bengal	Karnataka	Odisha Karnataka	
26		Sikkim	Uttar Pradesh	H.P	
27		Uttar Pradesh	H.P	West Bengal	
28		Chhattisgarh Karnataka	West Bengal		
29		Arunachal Pradesh			

3.4. Insights into the questionnaire

Computer Literacy

Computer literacy is a major driving force which enables an individual to be digitally literate. The computer literacy of a beneficiary has been referred to the level of basic knowledge on the components, functions and applications of a computer and its basic usage. Having some basic skills in computer enables an individual to explore more job opportunities, meet their information needs, understand the impact of computer in the society and many others. Basic computer literacy often includes knowledge on input devices (mouse, keyboard etc.), processing devices (CPU, RAM etc.) and output devices (monitor, printer, speaker etc.).

In our study, three questions have been framed in this section which intends to test the basic computer skills of the individual. They are as follows:

Does your family own a computer – Owning a computer generally implies a higher level of knowledge and usage of it at least by one of the family members. Thus, it can be said that at least one person from the family is digitally literate which in turn increases the possibility that other members of the family are also digitally literate.

Frequency of usage of computer – Computers, in today's world, have become electronic devices of almost every day use for individuals regardless of their age, and essentially, they are widely used in all the business dealings that are made nowadays. More frequent use of computers lead to higher rate of saving time, improved efficiency and productivity.

Which of the following is not a component of the Computer – This question analyzes the basic computer knowledge of the respondent.

Mobile Literacy

A mobile phone is a wireless handheld device that allows users to make calls and send text messages in addition to the other features. It is the most prevalent tool in developing countries with a high penetration rate. Nowadays, mobile phones are packed with lot of additional features like web browsers, games, cameras, video players, navigational systems etc. A basic mobile phone is one of the simplest phones through which one can only make or receive calls and text messages. Modern mobile phones or smart phones have a lot of additional features that can be used for communication, computing and entertainment. These phones do multiple tasks from email and web browsing to playing music, capturing and playing videos, storing and managing data, etc. The ownership of mobile phones is increasingly common in almost all the socio-economic segments of the society. It facilitates

knowledge-centred learning by providing efficient and inventive methods. Mobile permits collaborative learning and continued conversation despite physical location and thus advance the process of coming to know, which occurs through conversations across contexts and among various people via several mobile technologies.

In this section, following questions have been asked to the beneficiaries to assess their level of mobile literacy:

What type of device do you use – Type of mobile device used by an individual plays a significant role to understand the level of digital literacy. While a basic phone could be used for performing balance enquiry, saving contacts, sending messages etc. a smart phone could be used for making video calls, drafting e-mails etc. in addition to the basic features. Accessing all these features indicate the level of mobile literacy of an individual.

Level of comfort in connecting Wi-Fi in Smart Phone – Wi-Fi is a method for devices such as smartphones to connect wirelessly to the Internet using radio waves. Connecting to the Internet using Wi-Fi, whenever available, prove to be cheaper and make the phone run more efficiently in the long run than relying on cellular networks. In many situations, strong, dedicated Wi-Fi connection results in undisturbed audio-video streaming. Higher the use of Wi-Fi in smart phone, higher the level of comfort.

Level of comfort in making video calls (Skype, Hangout etc.) – Video calling, nowadays, is one of the most effective ways of staying in touch. Mobile-based video calls are growing in numbers every day and is used both for personal and business purpose. Higher level of comfort in making video calls indicates greater number of mobile literate people.

Awareness on saving a contact – Phone numbers can be saved either in the SIM card or in the memory card depending upon the type of the phone used by an individual. While a basic phone could store only the name and phone number, a smart phone, in addition to the name

and phone number, could also store Fax numbers, addresses, user photos, e-mails etc. Knowledge on saving a contact allows an individual to save time and dial the number from the saved contact list of the phone.

Awareness on performing balance enquiry – One of the basic functions performed by an individual is to check balance in the phone. Various service providers have various codes/numbers dialing which will result in display of the available balance or talktime. Awareness on performing balance enquiry helps an individual to keep track of the money available for making calls in order to avoid unforeseen events.

Technology Literacy

The use of information technology has become a part of our daily life. It allows an individual not only to share information quickly and efficiently, but also to bring down linguistic and geographic boundaries among each other. With the help of information technology, communication has also become cheaper, quicker, and more efficient. Many collaboration platforms have been built in addition to face to face call via mobile devices. Information technology has also facilitated streamlining business process thus making them cost effective. Moreover, creation of new job opportunities attracts many students and professionals to the field of information technology.

This section, containing four questions, analyses an individual's ability to utilize technology for some meaningful purposes. Also, this enables to understand the individual's ease in reading/writing emails, accessing social networking platforms etc. among others.

Skills of reading/writing an e-Mail – e-mail is a method of exchanging digital messages between people using digital devices such as computers, tablets and mobile phones. Sending an email is much less expensive than sending postal mail, or long-distance telephone calls. e-

mail, by its nature, creates a detailed written record of the communication, the identity of the sender(s) and recipient(s) and the date and time the message was sent. In the event of a contract or legal dispute, saved emails can be used to prove that an individual was advised of certain issues, as each email has the date and time recorded on it. To access e-mail, an individual need to have an e-mail ID which can be created by following few easy and user-friendly steps. An individual, using e-mail facility, is considered as technology literate. Thus, higher skill in reading/writing an e-Mail leads to higher technology literacy.

What are the Purposes of using Technology – Internet has transformed the world into a global village that can be navigated at the click of a mouse. Today is the world of internet, one can shop through the internet, pay bills, plan finances, avail online courses, find jobs, work from home, promote business, reach out people etc. Newspapers have become the traditional means to search for jobs as the internet provides updated details of the job openings. Email notification option can be used to receive the emails regarding the jobs thereby keeping an individual updated with all kinds of openings. Online courses are the next big change that allows the people to study and work both at the same time. This has been possible only through the internet. It has also brought a greater visibility and credibility for the farmers who can find out the market price of the crops produced and thus can grab the marketplace for more business. Thus, this question, intends to identify the purposes for which technology has been used by most of the respondents.

Ease of accessing social networking sites – Internet has filled up a wide gap by providing social networking platforms like facebook, twitter, whatsapp etc. which an individual can use both for business and personal purpose. Hence, the aim of this question is to understand the level of ease of a respondent in accessing social networking sites.

Reporting a grievance to the Local Government using mobile/computer – Internet can be used by an individual to lodge complain about broken roads, poor drainage etc. in their neighborhood. Online reporting of grievances results in greater transparency, mass outreach and thus adoption of better monitoring systems in order to solve problems. An individual can use mobile/computer to register a complaint in a structured manner simply by following Interactive Voice Response (IVR) or SMS system. Higher number of reported grievance using mobile/computer by an individual indicates greater technology literacy. Thus, this question intends to identify the frequency of reporting a grievance by an individual.

Training

Number of Trainees per batch – this factor plays an important role in training. An optimum batch size allows the trainer to focus on each trainee thus making the sessions more participatory and interactive.

Level of satisfaction with the computers/laptops available during the training – It is important to have practical sessions to understand the basic applications of a computer/laptop. Making computers/laptops available for the trainees in a single batch allows an individual to spend more time to internalize the theory learnt during the training. This, in turn, leads to a higher level of satisfaction.

Conduct of periodic assessments – Conducting short assessments at a regular interval during the entire course of the training helps the trainer to monitor the performance of the trainees and take suitable actions accordingly. It is a way through which poor performing individuals can be identified and special focus can be given. Thus, the average performance of the batch increases which makes the training more efficient.

How did you find the assessment – It is equally important to give necessary attention to the questions asked to the trainees during the assessment. A proper linkage between the curriculum taught and the level of knowledge intake of the trainees makes an assessment effective. Hence, the degree of difficulty of the assessment for an individual measures his/her level of technology literacy.

Power supply to the class – Power supply plays a critical role during a training. Regular power supply ensures smooth functioning of the computers/laptops and internet connectivity. Thus an uninterrupted power supply ensures smooth conduct of a training session.

Availability of internet facility at the training center – Availability of internet facility at the training centre is important as it permits the trainee to explore more areas by using a computer/laptop.

Responsiveness of the trainer to your queries – A training is said to be effective when there is a two way communication between the trainees and the trainer. While trainees are supposed to pose queries, it is important for a trainer to listen to the queries carefully and give proper feedback. The responsiveness of the trainer, thus, plays a key role in making a training successful.

Availability of Hands on training sessions with the mobile/laptop/computer – A training on computers/laptops/mobiles demands hands on sessions where the trainees get an opportunity to transform their classroom knowledge into reality. Availability of sufficient hands on training sessions motivates an individual to be trained and become technology literate.

Impact

Level of confidence in using digital devices after the training – It is important to consider the level of confidence of an individual in using digital devices after the training. A higher confidence level allows an individual to use computer/laptop/mobile in a far efficient manner.

Level of ease in using computer after training – The level of ease in using a computer after training acts as a vital indicator to measure the impact of training on an individual. Higher level of ease ensures performance of digital activities in a time saving and cost-effective way.

Level of ease in using mobile after training – Higher level of ease in using mobile after training makes an individual more confident and allows him/her to stay connected with the rest of the world.

Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc. – It is important to understand the purpose of accessing website(s)/ portal(s) by an individual. It varies depending upon the individual needs which again depends on several factors like age, occupation, family income and many others. A meaningful use of technology keeps an individual updated and helps to prosper in future.

Educating others (family, friends etc.) about the use of IT – educating others is considered to be very crucial. A digitally literate person acts as a change agent as (s)he encourages and motivates his/her family members, friends to become IT literate. On the other hand, as a digitally literate person secures a better place in the society he/she belongs to, the rest of the people also get attracted to become so. Hence, a higher rate of educating others (family, friends etc.) about the use of IT has a trickledown effect which makes the entire society digitally literate.

Recommending the training to your family members / friends – In a society in a rural area where the outreach of internet or newspaper is absent or minimal, word of mouth plays a

major role in awareness generation. Trainees, after successful completion of training, can recommend the training programme to their family members / friends explaining the positive impact of the same.

Difficulties faced during the training – It is always important to identify the difficulties faced by a trainee while undergoing the training programme. This helps to understand the areas and scope of further improvement. However, lower number of difficulties faced implies higher success rate of the training programme.

3.5. Data Analysis

The study is exploratory in nature. It tries to understand the nature (which dimensions) and degree of impact of the training programme. The aim of the analysis is to produce a credible assessment of impact of the training programme on each respondent on computer literacy, mobile literacy, technology literacy, training infrastructure etc.

An illustrative online questionnaire was prepared and has been attached as an Annexure. The original questionnaire used for the telephonic survey has been revised based on a series of discussions with CSC e-Governance Services Ltd. The investigators were trained to understand the nature of the survey, focus of the study and also to interpret individual items in the questionnaire.

The questionnaire was broadly categorized under six heads:

Table – 7: Details of the Questionnaire

Sl. No.	Head	No. of Questions	Content
1.	Details of the Trainee	13	Basic personal details of the beneficiary were cross verified with the data furnished by CSC e-Government Services India Ltd. Some details viz. profession/qualification, purpose of attending the training were also recorded.
2	Computer	02	This section intends to test the basic computer skills of the individual.
3.	Mobile	05	This section intends to test the basic mobile usage skills of the individual. It primarily focuses on the usage of smart phone, accessing Wi-Fi services, making video calls etc. among others.
4.	Technology	05	This analyses individual's ability to utilize technology for some meaningful purposes. Also, this enables to understand the individual's ease in reading/writing emails, accessing social networking platforms etc. among others
5.	Training	08	Basic infrastructure facilities, effectiveness and efficacy of the training is assessed here.
6.	Impact	07	This is one of the crucial parts in the questionnaire. It covers the personal and social impact with respect to the individual's perspective.

Source: Online Questionnaire

A telephonic survey of 51,748 respondents had been conducted to collect information on the above said heads. The reference period for the telephonic survey for this study was January, 2017 – February, 2017.

The measurements are based on the available information. An analysis of differences between the pre-implementation and post-implementation of the training programme was presented to measure the impact of the training programme.

A credible assessment of the impact of the training programme was made on the following key dimensions:

Social Impact

- Access to Govt. portals/schemes
- Access to day to day affairs (newspapers, other news portals/google search)
- Level of participation in social groups (SHGs, Cooperative Societies etc.)
- Use of technology for community welfare (citizen journalism, law & order issues, basic services etc.)
- Role in decision making at village level
- Level of interest in imparting/recommending technology to others
- Educating other members of the family
- Self esteem

Personal Impact

- Access to job portals/ banking services
- Morale boost
- Strengthen family/social bonding
- Building a suitable career
- Enhancement of interpersonal/soft skills

The responses of the beneficiaries were recorded either in a "Yes/No" format where numeric values can be assigned or by using a three/five point Likert Scale.

A set of attributes were prepared and each respondent was asked to rank them based on their desirability. Thus, a rank correlation coefficient was computed to understand the most effective attributes of the training programme.

A detailed fact sheet was prepared for each beneficiary. The data was analyzed using the Excel and SAS statistical package.

3.6. Use of tools and techniques

Likert Scale: Likert scale is the sum of responses on several Likert items. Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally, the level of agreement or disagreement is measured. Often five ordered and three ordered response levels are used. Sometimes an even-point scale is used, where the middle option of "Neither agree nor disagree" is not available. This is sometimes called a "forced choice" method, since the neutral option is removed. The neutral option can be seen as an easy option to take when a respondent is unsure, and so whether it is a true neutral option is questionable. While comparing between a 4-point and a 5-point Likert scale, where the former has the neutral option unavailable, the overall difference in the response is negligible. The value assigned to a Likert item has no unique mathematical property. The value assigned for each Likert item is simply determined on the basis of the necessity of the research. However, Likert items tend to take progressive positive integer values. Likert scales typically range from 2 to 10 – with 5 or 7 being the most common. In this, the typical structure of the Likert scale is such that each progressive Likert item is treated as having a better response than the preceding value. (This may differ in cases where reverse ordering of the Likert Scale is needed). A good Likert scale will present symmetry of Likert items. In such symmetric scaling, equidistant attributes will be more clearly inferred.

In our study, we have used both 3-point and 5-point Likert Scale to assess the level of computer literacy, mobile literacy, technology literacy and overall impact on the beneficiary and also to understand the infrastructural availability of the training.

Pearson Correlation Coefficient: Pearson correlation coefficient measures the strength and direction of linear association between two variables. It is referred to as Pearson's correlation or simply as the correlation coefficient.

The symbol for Pearson's correlation is "ρ" when it is measured in the population and "r" when it is measured in a sample. The symbol for Pearson's correlation is "ρ" when it is measured in the population and "r" when it is measured in a sample. The value of correlation coefficient can range from -1 to +1. An r of -1 indicates a perfect negative linear relationship between variables, an r of 0 indicates no linear relationship between variables, and an r of 1 indicates a perfect positive linear relationship between variables.

Since we are dealing exclusively with samples, we will user to represent Pearson's correlation as shown below:

$$r_{X,Y} = \frac{Cov\ (X, Y)}{\partial_X, \partial_Y}$$

Where $Cov\ (X, Y)$ = Covariance

∂_X = Standard Deviation of X

∂_Y = Standard Deviation of Y

T-test: t-test is a statistical hypotheses test in which the test statistic follows a Student's t-distribution under the null hypothesis. It can be used to determine if two sets of data are significantly different from each other. The statistical significance of t-test indicates whether or not the difference between two groups' averages most likely reflects a "real" difference in the population from which the groups were sampled. Statistical significance is determined by the size of the difference between the group averages, the sample size, and the standard deviations of the groups.

Table – 8: Types of t-test

Test	Purpose
One sample t-test	Tests whether the mean of a single population is equal to a target value
Two sample t-test	Tests whether the difference between the means of two independent populations is equal to a target value
Paired t-test	Tests whether the mean of the differences between dependent or paired observations is equal to a target value
t-test in regression output	Tests whether the values of coefficients in the regression equation differ significantly from zero

Mathematically, t-test is represented as follows:

$$t = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{\partial_x^2}{n_1}} + \sqrt{\frac{\partial_y^2}{n_2}}}$$

In our study, we have used two sample t-test to compare the mean and standard deviation of samples of different states.

Chi-square (χ^2) test: A chi-squared test is a statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test.

Pearson's chi-squared test, also known as the chi-squared goodness-of-fit test or chi-squared test for independence. When the chi-squared test is mentioned without any modifiers or other precluding contexts, this test is often meant.

To perform the test, two hypotheses have to be set up:

Null Hypothesis – The two categorical variables are independent

Alternative Hypothesis – The two categorical variables are dependent

The chi-square test statistic is calculated by using the formula:

$$\chi^2 = \frac{\sum(O - E)^2}{E}$$

Where O represents the observed frequency and E represents the expected frequency under the null hypothesis and computed by $E = \frac{row\ total\ X\ column\ total}{total\ sample\ size}$

We will compare the calculated value with the tabulated value with degrees of freedom (df) = (r -1)(c - 1) and will accept/reject the null hypothesis accordingly.

Analysis of Variance (ANOVA): ANOVA is a statistical procedure used to test the degree to which two or more groups vary or differ in an experiment. A great deal of variance (or difference) usually indicates that there was a significant finding from the research.

ANOVA test is performed on the basis of two hypotheses:

Null Hypothesis – A null hypothesis is the assumption that there will be no differences between groups that are tested and therefore, no significant results will be revealed.

Alternative Hypothesis – this hypothesis states that there will be a difference between groups as indicated by the ANOVA performed on the data.

In this study, a two factor ANOVA has been used to compare more than two groups at the same time to determine whether a variation exists between them.

Logit Model: Out of the variety of methods for scoring models, in this study we focus on logit model approach. Logit model is a widely used statistical parametric model for modeling binary dependent variable and is supported by statistical tests verifying estimated parameters. In statistics, logistic regression is a type of regression analysis used for predicting the outcome of a categorical (a variable that can take on a limited number of categories) criterion variable based on one or more predictor variables. The probabilities describing the possible outcome of a single trial are modeled, as a function of explanatory variables, using a logistic function.

Logistic regression can be binary or multinomial. Binomial or binary logistic regression refers to the instance in which the observed outcome can have only two possible types (e.g., "dead" vs. "alive", "success" vs. "failure", or "yes" vs. "no"). Multinomial logistic regression refers to cases where the outcome can have three or more possible types (e.g., "better' vs. "no change" vs. "worse"). Generally, the outcome is coded as "0" and "1" in binary logistic regression as it leads to the most straightforward interpretation. The target group (referred to as a "case") is usually coded as "1" and the reference group (referred to as a "noncase") as "0".

Like other forms of regression analysis, logistic regression makes use of one or more predictor variables that may be either continuous or categorical. However, logistic regression is used for predicting binary outcomes (Bernoulli trials) rather than continuous outcomes. It is necessary that logistic regression take the natural logarithm of the odds (referred to as the logit or log-odds) to create a continuous criterion. The logit of success is then fit to the predictors using regression analysis. The results of the logit model can be converted back to the odds via the exponential function or the inverse of

the natural logarithm. Therefore, although the observed variables in logistic regression are categorical, the predicted scores are actually modeled as a continuous variable (the logit).

Logistic regression is used extensively in numerous cases, like, the medical and social sciences fields, natural language processing, marketing applications such as prediction of a customer's propensity to purchase a product or cease a subscription, etc. In each of these instances, a logistic regression model would compute the relevant odds for each predictor, take the natural logarithm of the odds (compute the logit), conduct a linear regression analysis on the predicted values of the logit, and then take the exponential function of the logit to compute the odds ratio. In our study, the logit model is used in order to identify the influence of demographic factors like age, caste, education etc. on the probability of increased digital literacy of the beneficiaries.

IV. Impact Assessment

Quality of Improvement – Five Point Likert Scale

The quality of improvement has been assessed on different attributes. In addition, the overall quality has also been assessed. Respondents rated each question on a five point scale. For each attribute, an average score has been computed for all respondents from each State using the numeric values of 1-0 where 1 represents the best and 0 represents the worst outcome respectively. Assuming equal weights for each of the following 9 questions, an average score was computed and presented in the following table:

Table – 9: Mean value for North Zone

Question	Mean of the response (on a 5 point Likert Scale)						
	Haryana	H.P	J&K	Punjab	Rajasthan	Delhi	Chandigarh
Level of comfort in connecting Wi-Fi in Smart Phone	0.87	1.67	0.81	1.23	1.42	1.5	0.63
Level of comfort in making video calls	1.66	1.82	1.01	1.43	1.52	1.86	1.02
Ease of accessing social networking sites	0.75	1.26	0.81	1.21	1.42	1.4	0.67
Reporting a grievance to the Local Government using mobile/ computer	0.10	0.03	0.05	0.10	0.54	0	0.67
Nature of assessment	1.11	1.72	1.93	1.57	1.63	1.56	1.09
Level of confidence in using digital devices after the training	1.12	2.08	0.99	1.77	1.57	1.6	1.09

Question	Mean of the response (on a 5 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.	0.56	1.93	0.29	1.61	1.50	1.7	0.66
Educating Others (family, friends etc.) about the use of IT	1.14	2.35	0.68	1.96	1.73	1.73	1.14
Recommending the training to your family members / friends	1.12	2.24	0.97	1.81	1.54	1.7	1.16
Grand Mean	**0.94**	**1.68**	**0.84**	**1.41**	**1.43**	**1.45**	**0.90**

The above table shows that Haryana has the highest quality of improvement on computer literacy, mobile literacy, technology literacy, level of satisfaction about training infrastructure with an average value close to 1 followed by Chandigarh and J&K. On the other hand, response from all the other states stands between good and satisfactory (i.e., a value between 1 and 2) with Himachal Pradesh showing the least satisfactory improvement of the respondents after attending the training.

Table – 10: Mean value for South Zone

Question	Mean of the response (on a 5 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Level of comfort in connecting Wi-Fi in Smart Phone	0.35	1.83	1.20	1.67	1.73	1.11
Level of comfort in making video calls	1.03	1.68	1.40	1.83	1.92	1.34
Ease of accessing social networking sites	0.68	1.84	1.40	1.42	1.72	1.18
Reporting a grievance to the Local Government using mobile/ computer	0.32	0.42	0.20	0	0.92	0.22
Nature of assessment	1.14	1.70	1.0	1.33	1.75	1.43
Level of confidence in using digital devices after the training	1.05	2.04	1.40	1.59	1.69	1.60
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	0.33	2.17	1.20	1.42	1.69	1.66
Educating Others (family, friends etc.) about the use of IT	1.06	2.26	1.20	1.67	1.69	1.80
Recommending the training to your family members / friends	1.06	2.03	1.00	1.59	1.73	1.48
Grand Mean	**0.78**	**1.77**	**1.11**	**1.39**	**1.65**	**1.31**

In South Zone, Andhra Pradesh tops the table with an average of 0.78 implying a good level of improvement when compared to the other States. Respondents from the state of Karnataka shows an improvement at a satisfactory level with an average value of 1.77 while the quality of improvement for all the other states stands between good and satisfactory (i.e., a value between 1 and 2).

Table – 11: Mean value for East Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Level of comfort in connecting Wi-Fi in Smart Phone	1.35	0.60	1.50	0
Level of comfort in making video calls	1.52	0.90	1.74	2.08
Ease of accessing social networking sites	1.39	0.71	1.69	1.91
Reporting a grievance to the Local Government using mobile/computer	0.43	0	0	0.17
Nature of assessment	1.62	1.41	1.89	1.92
Level of confidence in using digital devices after the training	1.57	1.39	1.96	2.05
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	1.53	1.17	1.97	2.03
Educating Others (family, friends etc.) about the use of IT	1.76	1.38	2.03	2.71
Nature of assessment	1.35	0.60	1.50	2.18
Recommending the training to your family members / friends	1.59	1.39	2.03	2.61
Grand Mean	**1.42**	**0.99**	**1.64**	**1.72**

The above table for the east zone represents that Jharkhand has the highest quality of improvement for the above said attributes whereas Bihar, Odisha, and West Bengal secures the second, third and fourth position respectively.

Table – 12: Mean value for West Zone

Question	Mean of the response (on a 5 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Level of comfort in connecting Wi-Fi in Smart Phone	0.30	1.30	1.19
Level of comfort in making video calls	1.20	1.57	1.29
Ease of accessing social networking sites	0.90	1.28	1.08
Reporting a grievance to the Local Government using mobile/computer	0.40	0.01	0.67
Nature of assessment	1.00	1.75	1.22
Level of confidence in using digital devices after the training	1.10	1.75	1.24
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	0.30	1.81	1.10
Educating Others (family, friends etc.) about the use of IT	1.10	1.93	1.36
Recommending the training to your family members / friends	1.10	1.63	1.21
Grand Mean	**0.82**	**1.45**	**1.15**

From the above table, it can be found that the overall impact of the training is highest on the respondents of Goa while it is low for Gujarat.

Table – 13: Mean value for North-East Zone

Question	Mean of the response (on a 3 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Level of comfort in connecting Wi-Fi in Smart Phone	0.49	1.67	1.73	0.52	1.45	2.09
Level of comfort in making video calls	0.98	1.92	1.63	0.76	1.59	2.21
Ease of accessing social networking sites	0.66	1.56	1.54	0.71	1.38	2.07
Reporting a grievance to the Local Government using mobile/ computer	0.02	0	1.02	0.16	0.16	0
Nature of assessment	1.43	2.11	1.73	0.98	1.58	2.04
Level of confidence in using digital devices after the training	0.99	1.97	1.86	1.01	1.69	2.25
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	0.08	1.44	1.75	0.70	1.30	2.07
Educating Others (family, friends etc.) about the use of IT	0.56	1.58	1.94	0.89	1.47	2.17
Recommending the training to your family members / friends	0.91	1.53	1.91	0.98	1.37	1.85
Grand Mean	**0.68**	**1.53**	**1.68**	**0.74**	**1.33**	**1.86**

From the above table, it is evident that the respondents from the state of Mizoram has experienced the highest quality of improvement after attending the training followed by Arunachal Pradesh, Nagaland, Assam, Manipur and Sikkim.

Table – 14: Mean value for Central Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Level of comfort in connecting Wi-Fi in Smart Phone	1.98	1.01	1.51	1.72
Level of comfort in making video calls	1.99	1.23	1.51	1.81
Ease of accessing social networking sites	1.78	1.12	1.32	1.64
Reporting a grievance to the Local Government using mobile/ computer	0.15	0.12	0.27	0.25
Nature of assessment	2.09	1.32	1.50	1.83
Level of confidence in using digital devices after the training	2.25	1.46	1.76	1.86
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	2.17	1.52	2.14	1.88
Educating Others (family, friends etc.) about the use of IT	2.15	1.71	2.27	2.08
Recommending the training to your family members / friends	1.85	1.65	1.51	1.75
Grand Mean	**1.82**	**1.24**	**1.53**	**1.65**

From the above table, it is clear that all the states in central zone have shown only a satisfactory improvement in the quality of the above said attributes with Madhya Pradesh on the top and Chhattisgarh at the bottom of the table.

Thus, all the States, taken together in a single table, can be represented and ranked based on the grand mean value of the overall quality of improvement.

Table – 15: Ranking of the States

Ranking	Zones					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Haryana	Andhra Pradesh	Jharkhand	Goa	Mizoram	Madhya Pradesh
Second	Chandigarh	Kerala	Bihar	Maharashtra	Arunachal Pradesh	Uttar Pradesh
Third	Jammu & Kashmir	Telangana	Odisha	Gujarat	Nagaland	Uttarakhand
Fourth	Punjab	Puducherry	West Bengal		Assam	Chhattisgarh
Fifth	Rajasthan	Tamil Nadu			Manipur	
Sixth	Delhi	Karnataka			Sikkim	
Seventh	Himachal Pradesh					

In our online questionnaire, 3 questions have been asked for which the responses received have been categorized in a 5 point Likert scale with 1 denoting the best outcome and 5 denoting the worst outcome respectively. The mean value of the State-wise response is shown in the following table:

Table – 16: Mean value for North Zone

Question	Mean of the response (on a 5 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Level of satisfaction with the computers/ laptops available during the training	2.63	1.84	4.50	2.25	2.21	2.13	2.34
Level of ease in using computer after training	2.91	2.44	2.55	2.52	2.36	2.47	2.88
Level of ease in using mobiles after training	1.11	1.89	1.11	2.07	2.25	1.57	1.11
Grand Mean	**2.22**	**2.06**	**2.72**	**2.28**	**2.27**	**2.06**	**2.11**

Table – 17: Mean value for South Zone

Question	Mean of the response (on a 5 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Level of satisfaction with the computers/ laptops available during the training	2.96	1.92	2.40	1.75	2.38	2.31
Level of ease in using computer after training	2.99	2.12	1.80	2.08	2.36	2.56
Level of ease in using mobiles after training	1.04	1.94	2.00	1.42	2.07	2.10
Grand Mean	**2.33**	**1.99**	**2.07**	**1.75**	**2.27**	**2.32**

Table – 18: Mean value for East Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Level of satisfaction with the computers/ laptops available during the training	2.22	2.00	1.82	2.03
Level of ease in using computer after training	2.39	2.56	2.18	2.08
Level of ease in using mobiles after training	1.61	1.39	1.66	2.01
Grand Mean	**2.07**	**1.98**	**1.89**	**2.04**

Table – 19: Mean value for West Zone

Question	Mean of the response (on a 5 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Level of satisfaction with the computers/laptops available during the training	2.80	1.91	2.20
Level of ease in using computer after training	2.70	2.46	2.28
Level of ease in using mobiles after training	1.10	1.64	1.97
Grand Mean	**2.20**	**2.00**	**2.15**

Table – 20: Mean value for North-East Zone

Question	Mean of the response (on a 3 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Level of satisfaction with the computers/ laptops available during the training	2.51	2.25	2.17	2.17	2.05	2.00
Level of ease in using computer after training	2.34	2.72	2.27	2.27	2.52	2.34
Level of ease in using mobiles after training	1.09	2.08	2.13	2.08	2.07	1.91
Grand Mean	**1.98**	**2.35**	**2.19**	**2.17**	**2.21**	**2.08**

Table – 21: Mean value for Central Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Level of satisfaction with the computers/laptops available during the training	2.04	1.84	1.45	2.13
Level of ease in using computer after training	2.31	2.51	2.09	2.58
Level of ease in using mobiles after training	1.96	1.87	1.87	2.12
Grand Mean	**2.10**	**2.07**	**1.80**	**2.28**

Table – 22: Ranking of the States

Ranking	Zones					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Delhi Himachal Pradesh	Karnataka	Jharkhand	Gujarat	Arunachal Pradesh	Uttar Pradesh
Second	Chandigarh	Puducherry	Odisha	Maharashtra	Sikkim	Madhya Pradesh
Third	Haryana	Kerala	West Bengal	Goa	Mizoram	Chhattisgarh
Fourth	Rajasthan	Tamil Nadu	Bihar		Manipur	Uttarakhand
Fifth	Punjab	Telangana			Nagaland	
Sixth	J & K	Andhra Pradesh			Assam	
Seventh						

Analysis on number of trainees per batch

In this section, the respondents from all the 30 States have been analyzed in a 5 point Likert scale, each point having the following values:

1 – 0-5

2 – 6-10

3 – 11-20

4 – 21-30

5 – 31 & above

The analysis has been performed zone wise and below mentioned are the results obtained.

Table – 23: Mean value for North Zone

Question	Mean of the response (on a 5 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Number of trainees per batch	3.95	3.50	3.11	3.64	3.60	3.63	3.71

Table – 24: Mean value for South Zone

Question	Mean of the response (on a 5 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Number of trainees per batch	3.51	3.44	3.20	2.25	4.05	3.84

Table – 25: Mean value for East Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Number of trainees per batch	3.68	2.67	3.37	3.81

Table – 26: Mean value for West Zone

Question	Mean of the response (on a 5 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Number of trainees per batch	4.20	3.57	3.54

Table – 27: Mean value for North-East Zone

Question	Mean of the response (on a 5 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Number of trainees per batch	3.26	3.39	3.54	3.97	3.84	3.65

Table – 28: Mean value for Central Zone

Question	Mean of the response (on a 5 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Number of trainees per batch	3.31	3.62	3.70	3.38

From the above data, it can be seen that for the north zone, all the states are having values between 3 and 4, thus implying that the average number of trainees per batch varies between 11 to 30 with Haryana and Punjab having the highest and lowest average batch size respectively. In the south zone, Tamil Nadu is having the highest average number of trainees per batch with a value of 4.05 while all the other states are having an average batch size between 11 and 30. West Bengal, in the east zone, has the highest average number of trainees per batch which is close to 21 followed by Bihar, Odisha and Jharkhand respectively. In the west zone, Goa tops the table with an average number of trainees of 21 and above per batch whereas in the central zone, Uttar Pradesh is on the top with an average batch size between 11 and 30.

Analysis on skills of reading/writing e-Mail

The respondents for each of the 30 states has been analyzed on the basis of skills of reading/writing an e-Mail. The mean value has been calculated for each State and has been represented in a tabular format in a zone wise manner. It may be noted that the responses have been received in a 6 point Likert scale where 1 represents "Very Good" and 6 represents "Not at all" respectively. A lower mean value indicates higher positive impact on the skills of reading/writing an e-Mail and vice versa.

Table – 29: Mean value for North Zone

Question	Mean of the response (on a 6 point Likert Scale)						
	Haryana	H.P	J&K	Punjab	Rajasthan	Delhi	Chandigarh
Skills of reading/ writing an email	2.54	3.00	3.85	3.03	2.98	3.30	2.72

Table – 30: Mean value for South Zone

Question	Mean of the response (on a 6 point Likert Scale)					
	Andhra Pradesh	Karnataka	Kerala	Puducherry	Tamil Nadu	Telangana
Skills of reading/ writing an email	3.03	2.77	2.80	3.25	3.31	2.94

Table – 31: Mean value for East Zone

Question	Mean of the response (on a 6 point Likert Scale)			
	Bihar	Jharkhand	Odisha	West Bengal
Skills of reading/writing an email	2.54	4.29	2.10	3.42

Table – 32: Mean value for West Zone

Question	Mean of the response (on a 6 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Skills of reading/ writing an email	2.00	3.17	2.73

Table – 33: Mean value for North-East Zone

Question	Mean of the response (on a 6 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Skills of reading/ writing an email	3.81	4.44	3.16	2.79	3.74	3.66

Table – 34: Mean value for Central Zone

Question	Mean of the response (on a 6 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Skills of reading/writing an email	3.55	2.72	2.88	3.63

From the above analysis, it is evident that in the north zone, for the respondents from Haryana, the skill level in reading/writing an e-Mail is between "Good" and "Neither Good nor Bad" immediately followed by Chandigarh and Rajasthan. For the other states, the skill level lies between "Neither Good nor Bad" and "Bad". In the south zone, Karnataka, Kerala and Telangana are having an average skill level between "Good" and "Neither Good nor Bad" in terms of reading/writing an e-Mail whereas for the other states it is between "Neither Good nor Bad" and "Bad". Odisha tops the east zone with an average value between "Good" and "Neither Good nor Bad" whereas Jharkhand shows the poorest impact. Goa, Mizoram

and Uttar Pradesh reflects the best impact compared to their counterparts in West, North-East and Central zone respectively.

Table – 35: Ranking of the States

Ranking	Skills of reading/writing an e-Mail (Zone wise)					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Haryana	Karnataka	Odisha	Goa	Mizoram	Madhya Pradesh
Second	Chandigarh	Kerala	Bihar	Maharashtra	Manipur	Uttar Pradesh
Third	Rajasthan	Telangana	West Bengal	Gujarat	Sikkim	Chhattisgarh
Fourth	Himachal Pradesh	Andhra Pradesh	Jharkhand		Nagaland	Uttarakhand
Fifth	Punjab	Puducherry			Arunachal Pradesh	
Sixth	Delhi	Tamil Nadu			Assam	
Seventh	J&K					

Analysis on purposes of using technology

Respondents from all the states have been analyzed on the basis of the purposes of using technology by them. The responses received have been assigned values from 1 to 6 for the following six purposes:

1. Agriculture Market Price Information
2. Utility Bill Payment (Ticket Booking, Online Recharge)/Online Banking
3. Getting information about educational/ employment opportunities
4. Weather Information
5. Accessing Govt. Websites/Filing online Applications (PAN Card, Passport etc)
6. Others

It is very likely that a respondent might use technology for multiple purposes. Keeping this possibility in mind, further values, i.e., from 7 onwards, have been assigned for combinations of two purposes. To give an example, a combination of (1,2) will get the value 7, a combination of (1,3) will get the value 8 and so on and so forth. Similarly, once the combination of two purposes end, combinations of 3 purposes will start like (1,2,3), (1,2,4) and so on. The values have been assigned to each of the combination in a chronological order. In brief it can be shown as follows:

Table – 36: Values of the Purpose of Using Technology

Purpose	Value
Single	1 – 6
Double	7 – 21
Triple	22 – 41
Combination of four	42 – 56
Combination of five	57 – 62
Combination of six	63

The mean value for each state has been calculated zone wise depending upon their purposes of using technology. Thus a higher mean value represents use of technology by a state for multiple purposes.

Table – 37: Mean Value for North Zone

Question	Mean of the response						
	Haryana	H.P	J&K	Punjab	Rajasthan	Delhi	Chandigarh
Purposes of using Technology	4.14	5.24	19.05	9.03	9.76	7.40	5.48

Table – 38: Mean Value for South Zone

Question	Mean of the response					
	Andhra Pradesh	Karnataka	Kerala	Puducherry	Tamil Nadu	Telangana
Purposes of using Technology	5.04	10.90	3.00	11.92	4.25	11.66

Table – 39: Mean Value for East Zone

Question	Mean of the response			
	Bihar	Jharkhand	Odisha	West Bengal
Purposes of using Technology	22.33	4.35	7.45	6.10

Table – 40: Mean Value for West Zone

Question	Mean of the response		
	Goa	Gujarat	Maharashtra
Purposes of using Technology	4.40	6.49	23.47

Table – 41: Mean Value for North-East Zone

Question	Mean of the response					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Purposes of using Technology	13.73	21.14	11.84	30.36	19.41	22.71

Table – 42: Mean Value for Central Zone

Question	Mean of the response			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Purposes of using Technology	17.54	6.65	16.44	21.63

From the above analysis, it can be seen that for Jammu & Kashmir, the value is 19.05 which means that the respondents have used the technology for two purposes which could be a combination of any two. Punjab, Rajasthan and Delhi stands at second, third and fourth position respectively. Haryana, Himachal Pradesh and Chandigarh have used technology for any single purpose. In the south zone, a combination of any two purposes have been used by the respondents from Karnataka, Puducherry and Tamil Nadu whereas the respondents from the other state have used technology for any single purpose. Respondents from Bihar and Maharashtra have used technology for three purposes simultaneously in their respective zones while the other states have used the same for any single purpose. In the north-east, Mizoram, Sikkim and Assam have used the technology for three purposes whereas the other three states have used the same for two purposes. In the central zone, respondents from Uttarakhand have used technology for three purposes while Chhattisgarh and Uttar Pradesh have used it for two purposes followed by Madhya Pradesh where it has been used for a single purpose.

Table – 43: Ranking of the States

Ranking	Zones					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	J&K	Puducherry	Bihar	Maharashtra	Mizoram	Uttarakhand
Second	Rajasthan	Telangana	Odisha	Gujarat	Sikkim	Chhattisgarh
Third	Punjab	Karnataka	West Bengal	Goa	Assam	Uttar Pradesh
Fourth	Delhi	Andhra Pradesh	Jharkhand		Nagaland	Madhya Pradesh
	Chandigarh	Tamil Nadu			Arunachal Pradesh	
	H.P	Kerala			Manipur	
Fifth	Haryana					

Quality of Improvement – Three Point Likert Scale

In this section, the quality of improvement have been assessed on different attributes. In addition, the overall quality has also been assessed. Respondents rated each question on a three point scale. For each attribute, an average score has been computed for all respondents from each State using the numeric values of 1-0 where 1 represents the best and 0 represents the worst outcome respectively. Assuming equal weights for each question, an average score was computed over all the questions:

Table – 44: Mean Value for North Zone

Question	Mean of the response (on a 3 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Awareness in using a mobile phone	1.00	0.99	0.98	1.00	1.01	1.00	1.00
Awareness in performing balance enquiry	1.00	1.00	0.99	0.99	1.00	1.03	1.00
Conduct of periodic assessments	1.06	1.42	0.58	1.29	1.09	1.30	0.98
Power supply in the class	1.00	1.003	0.98	1.00	1.04	1.00	1.01
Availability of internet facility at training center	1.00	1.09	0.96	1.06	1.05	1.00	1.00
Response of the trainer to your queries	1.00	1.00	1.00	1.00	1.05	1.00	1.00
Availability of hands on training session with mobile/laptops/ computers	1.00	0.90	0.95	1.00	1.05	1.00	1.00
Grand Mean	**1.00**	**1.05**	**0.92**	**1.04**	**1.04**	**1.04**	**0.99**

In the above table, Haryana is placed in the first position thereby implying that all the respondents from this state agreed to have the highest quality improvement on the above attributes after attending the training. Chandigarh and Jammu & Kashmir are in second and third place respectively depicting the quality of improvement close to good. The other states represent the quality of improvement between good and satisfactory.

Table – 45: Mean Value for South Zone

Question	Mean of the response (on a 3 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Awareness in using a mobile phone	1.00	1.14	1.00	1.00	1.43	1.05
Awareness in performing balance enquiry	1.00	1.01	1.00	1.08	1.42	1.01
Conduct of periodic assessment	1.00	1.09	1.00	1.08	1.51	1.19
Power supply in the class	1.00		1.00	1.08	1.63	1.03
Availability of internet facility at training center	1.00	1.06	1.00	1.08	1.64	1.03
Response of the trainer to your queries	1.00	1.10	1.00	1.25	1.63	1.04
Availability of hands on training session with mobile/ laptops/ computers	1.00	1.06	1.00	1.11	1.63	1.04
Grand Mean	**1.00**	**1.07**	**1.00**	**1.09**	**1.55**	**1.05**

In the south zone, the state of Andhra Pradesh and Kerala shares the same position with an average value of 1, thereby representing highest quality improvement of the respondents after attending the training. Telangana, Karnataka, Puducherry and Karnataka secures the second, third, fourth and fifth position respectively in the table.

Table – 46: Mean Value for East Zone

Question	Mean of the response (on a 3 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Awareness in using a mobile phone	1.04	1.00	1.00	1.20
Awareness in performing balance enquiry	0.99	1.00	1.00	1.18
Conduct of periodic assessment	1.05	1.01	1.42	1.32
Power supply in the class	1.01	1.00	1.00	1.12
Availability of internet facility at training center	1.01	1.00	1.02	1.07
Response of the trainer to your queries	1.01	1.00	1.02	1.08
Availability of hands on training session with mobile/ laptops/ computers	1.01	1.00	1.02	1.17
Grand Mean	**1.01**	**1.00**	**1.06**	**1.16**

From the above table, it can be seen that Jharkhand tops the east zone with a slight margin over Bihar indicating the highest quality improvement of the respondents after attending the training. On the other hand, the quality of improvement is between good and satisfactory for the states of Odisha and West Bengal.

Table – 47: Mean Value for West Zone

Question	Mean of the response (on a 3 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Awareness in using a mobile phone	1.00	1.04	1.10
Awareness in performing balance enquiry	1.00	1.00	0.99
Conduct of periodic assessment	1.00	1.49	1.00
Power supply in the class	1.00	1.00	1.00
Availability of internet facility at training center	1.00	1.00	0.99
Response of the trainer to your queries	1.00	1.00	0.99
Availability of hands on training session with mobile/laptops/computers	1.00	1.01	0.99
Grand Mean	**1.00**	**1.07**	**1.00**

In the west zone, Goa and Maharashtra jointly secures the first place which indicates the good quality of improvement among the respondents after attending the training followed by Gujarat where the quality of improvement is satisfactory.

Table – 48: Mean Value for North-East Zone

Question	Mean of the response (on a 3 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Awareness in using a mobile phone	0.97	1.22	1.04	1.00	1.80	1.15
Awareness in performing balance enquiry	0.98	1.05	1.01	1.00	1.00	1.00
Conduct of periodic assessment	0.75	0.86	1.22	1.00	1.00	1.07
Power supply in the class	0.99	1.02	1.15	0.98	1.00	1.00
Availability of internet facility at training center	0.93	1.66	1.20	0.98	1.09	1.11
Response of the trainer to your queries	0.94	1.08	1.19	0.97	1.09	1.02
Availability of hands on training session with mobile/ laptops/ computers	0.98	1.08	1.22	1.00	1.07	1.09
Grand Mean	**0.93**	**1.13**	**1.14**	**0.99**	**1.15**	**1.06**

From the above table, it can be said that Mizoram is having a good quality of improvement after attending the training followed by Arunachal Pradesh. States like Assam, Manipur, Nagaland, Sikkim experienced a level of quality improvement between good and satisfactory.

Table – 49: Mean Value for Central Zone

Question	Mean of the response (on a 3 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Awareness in using a mobile phone	1.05	1.02	1.22	1.03
Awareness in performing balance enquiry	1.00	1.00	0.99	1.01
Conduct of periodic assessment	1.05	1.08	1.09	1.10
Power supply in the class	1.00	1.00	1.02	1.07
Availability of internet facility at training center	1.33	1.02	1.02	1.32
Response of the trainer to your queries	1.01	1.00	1.02	1.11
Availability of hands on training session with mobile/ laptops/ computers	1.15	1.02	1.03	1.27
Grand Mean	**1.08**	**1.02**	**1.05**	**1.13**

In the central zone, the average response on quality of improvement is between good and satisfactory for all the States with Madhya Pradesh on the top followed by Uttar Pradesh, Chhattisgarh and Uttarakhand.

Thus, all the States, taken together in a single table, can be represented and ranked based on the grand mean value of the overall quality of improvement.

Table – 50: Ranking of the States

Ranking	Zones					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Haryana	Andhra Pradesh	Jharkhand	Goa	Mizoram	Madhya Pradesh
		Kerala		Maharashtra		
Second	Chandigarh	Telangana	Bihar	Gujarat	Arunachal Pradesh	Uttar Pradesh
Third	Jammu & Kashmir	Karnataka	Odisha		Sikkim	Chhattisgarh
Fourth	Punjab	Puducherry	West Bengal		Assam	Uttarakhand
	Rajasthan	Tamil Nadu			Manipur	
	Delhi				Nagaland	
Fifth	Himachal Pradesh					

Frequency of usage of computers – Four Point Likert Scale

In this section, the quality of improvement have been assessed on different attributes. In addition, the overall quality has also been assessed. Respondents rated each question on a three point scale. For each attribute, an average score has been computed for all respondents from each State using the numeric values of 1-4 where 1 represents the highest and 4 represents the least improvement in the quality of outcome respectively. Assuming equal weights for each question, an average score was computed over all the questions.

Table – 51: Mean Value for North Zone

Question	Mean of the response (on a 4 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Frequency of usage of computers	1.85	2.99	2.05	2.29	2.31	2.66	2.32

In the north zone, respondents from Haryana has an usage of computer between frequent and not so frequent. For the other states, the usage of computer is between not so frequent and rare.

Table – 51: Mean Value for South Zone

Question	Mean of the response (on a 4 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Frequency of usage of computers	2.71	2.62	2.20	2.16	2.66	2.71

In this zone, all the states have a computer use level between not so frequent and rare with Puducherry on the top with an use close to not so frequent.

Table – 52: Mean Value for East Zone

Question	Mean of the response (on a 4 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Frequency of usage of computers	2.02	2.96	2.76	2.44

All the states in the east zone have a computer use level between not so frequent and rare with Bihar having the highest usage level and Jharkhand having almost not so frequent usage level.

Table – 53: Mean Value for West Zone

Question	Mean of the response (on a 4 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Frequency of usage of computers	2.50	2.84	2.64

All the states in the west zone are having a computer usage level between not so frequent and rare with Goa having the most use and Gujarat having the least use.

Table – 54: Mean Value for North-East Zone

Question	Mean of the response (on a 4 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Frequency of usage of computers	1.73	2.41	2.20	1.74	2.90	2.37

In the above table, it is seen that the respondents from Arunachal Pradesh is in the top in the North-East zone with a computer usage level between very frequent and frequent followed by

Mizoram. States like Assam, Manipur, Nagaland and Sikkim are having an usage level between frequent and not so frequent.

Table – 55: Mean Value for Central Zone

Question	Mean of the response (on a 4 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Frequency of usage of computers	2.65	3.10	2.86	2.21

Uttarakhand, in the central zone, is having the most usage of computer with a level close to frequent whereas Madhya Pradesh stands in the bottom most with a computer usage level between not so frequent and rare.

A ranking of all the States taken together on frequency of usage of computer is shown in the following table:

Table – 56: Ranking of the States

Ranking	Zone wise Frequency of usage of computer					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Haryana	Puducherry	Bihar	Goa	Arunachal Pradesh	Uttarakhand
Second	Jammu & Kashmir	Karnataka	Odisha	Maharashtra	Mizoram	Chhattisgarh
Third	Punjab	Kerala	West Bengal	Gujarat	Manipur	Uttar Pradesh
Fourth	Rajasthan	Tamil Nadu	Jharkhand		Sikkim	Madhya Pradesh
Fifth	Chandigarh	Andhra Pradesh			Assam	
		Telangana				
Sixth	Delhi				Nagaland	
Seventh	Himachal Pradesh					

Difficulties faced during the training – Four Point Likert Scale

In this section, the quality of improvement has been assessed on different attributes. In addition, the overall quality has also been assessed. Respondents rated each question on a three point scale. For each attribute, an average score has been computed for all respondents from each State using the numeric values of 1-0 where 1 represents very much difficulties faced and 0 represents no difficulties faced at all respectively. Assuming equal weights for each question, an average score was computed over all the questions.

Table – 57: Mean Value for North Zone

Question	Mean of the response (on a 4 point Likert Scale)						
	Haryana	**H.P**	**J&K**	**Punjab**	**Rajasthan**	**Delhi**	**Chandigarh**
Difficulties faced during the training	0.01	0.03	0.04	0.00	0.53	0.00	0.00

In the north zone, Punjab, Delhi and Chandigarh shares the first position with no difficulties faced during the training whereas it is almost zero for Haryana, Himachal Pradesh and Jammu & Kashmir.

Table – 58: Mean Value for South Zone

Question	Mean of the response (on a 4 point Likert Scale)					
	Andhra Pradesh	**Karnataka**	**Kerala**	**Puducherry**	**Tamil Nadu**	**Telangana**
Difficulties faced during the training	0.00	0.56	0.00	0.50	0.41	0.56

Andhra Pradesh and Kerala, in the south zone, have faced no difficulty during the training followed by Tamil Nadu, Puducherry, Karnataka and Telangana respectively with difficulty level faced between very much and a few.

Table – 59: Mean Value for East Zone

Question	Mean of the response (on a 4 point Likert Scale)			
	Bihar	**Jharkhand**	**Odisha**	**West Bengal**
Difficulties faced during the training	0.18	0.00	0.00	0.39

In the east zone, respondents from Jharkhand and Odisha have experienced zero difficulty level during the training very frequent use of computer followed by Bihar and West Bengal respectively with a difficulty level between very much and a few..

Table – 60: Mean Value for West Zone

Question	Mean of the response (on a 4 point Likert Scale)		
	Goa	**Gujarat**	**Maharashtra**
Difficulties faced during the training	0.00	0.00	0.01

Goa and Gujarat jointly tops the south zone with no difficulties faced at all during the training slightly over Maharashtra.

Table – 61: Mean Value for North-East Zone

Question	Mean of the response (on a 4 point Likert Scale)					
	Arunachal Pradesh	**Assam**	**Manipur**	**Mizoram**	**Nagaland**	**Sikkim**
Difficulties faced during the training	0.05	1.27	1.09	0.00	0.39	0.92

Mizoram, in the north-east zone, is having a zero difficulty level faced by the respondents followed by Arunachal Pradesh and Nagaland. While the difficulty level faced during the training in Sikkim is very close to a few, it is between a few and rare for Assam and Manipur.

Table – 62: Mean Value for Central Zone

Question	Mean of the response (on a 4 point Likert Scale)			
	Chhattisgarh	**Madhya Pradesh**	**Uttar Pradesh**	**Uttarakhand**
Difficulties faced during the training	2.65	0.04	0.36	0.38

In the central zone, the difficulty level faced during the training is almost zero for Madhya Pradesh followed by Uttar Pradesh, Uttarakhand and Chhattisgarh respectively.

A ranking of all the States taken together on frequency of usage of computer is shown in the following table:

Table – 63: Ranking of the States

Ranking of the Zones

Ranking	Difficulties faced during the training (Zone wise)					
	North	**South**	**East**	**West**	**North-East**	**Central**
First	Delhi	Andhra Pradesh	Jharkhand	Goa	Mizoram	Madhya Pradesh
	Punjab	Kerala	Odisha	Gujarat		
	Chandigarh					
Second	Haryana	Tamil Nadu	Bihar	Maharashtra	Arunachal Pradesh	Uttar Pradesh
Third	Himachal Pradesh	Puducherry			Nagaland	Uttarakhand Pradesh
Fourth	Jammu & Kashmir	Tamil Nadu			Sikkim	Chhattisgarh
Fifth	Rajasthan	Karnataka			Manipur	
		Telangana				
Sixth					Assam	
Seventh						

Table – 64: Case – 1: Quality of improvement in a five point Likert scale

Question	Quality of improvement in a five point Likert scale (Mean Value)						
	North	**South**	**East**	**West**	**Central**	**North-East**	**Grand Mean**
Level of comfort in connecting Wi-Fi in Smart Phone	1.16	1.34	0.86	0.93	1.55	1.32	
Level of comfort in making video calls	1.47	1.56	1.56	1.35	1.63	1.51	
Ease of accessing social networking sites	1.07	1.37	1.42	1.09	1.46	1.32	
Reporting a grievance to the Local Government using mobile/computer	0.21	0.38	0.15	0.36	0.20	0.23	
Nature of assessment	1.52	1.47	1.71	1.32	1.68	1.64	
Level of confidence in using digital devices After the training	1.46	1.59	1.74	1.36	1.83	1.63	
Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc	1.18	1.45	1.67	1.07	1.92	1.22	
Educating Others (family, friends etc.) about the use of IT	1.53	1.70	1.97	1.46	2.05	1.43	
Recommending the training to your family members / friends	1.51	1.58	1.90	1.31	1.69	1.42	
Grand Mean	**1.23**	**1.38**	**1.44**	**1.14**	**1.56**	**1.30**	**1.30**

Table – 65: Case – 2: Quality of improvement in a five point Likert scale

Question	Quality of improvement in a five point Likert scale (Mean Value)					
	North	**South**	**East**	**West**	**Central**	**North-East**
Level of satisfaction with the computers/laptops available during the training	2.56	2.29	2.02	2.30	1.86	2.19
Level of ease in using computer after training	2.59	2.32	2.30	2.48	2.37	2.41
Level of ease in using mobiles after training	1.59	1.76	1.67	1.57	1.95	1.89
Grand Mean	**2.25**	**2.12**	**2.00**	**2.12**	**2.06**	**2.16**

Table – 66: Case – 3: Quality of improvement in a five point Likert scale

Question	Quality of improvement in a three point Likert scale (Mean Value)						
	North	**South**	**East**	**West**	**Central**	**North-East**	**Grand Mean**
Awareness in using a mobile phone	1.00	1.10	1.06	1.05	1.08	1.20	**1.10**
Awareness in performing balance enquiry	1.00	1.09	1.04	1.00	1.00	1.00	**1.03**
Conduct of periodic assessments	1.10	1.14	1.20	1.16	1.08	0.98	**1.11**
Power supply in the class	1.00	1.15	1.03	1.00	1.02	1.02	**1.04**
Availability of internet facility at training center	1.02	1.13	1.02	1.00	1.17	1.16	**1.10**
Response of the trainer to your queries	1.00	1.17	1.03	1.00	1.13	1.05	**1.08**
Availability of hands on training session with mobile/ laptops/ computers	0.98	1.14	1.05	1.00	1.12	1.07	**1.08**
Grand Mean	**1.01**	**1.13**	**1.06**	**1.03**	**1.08**	**1.07**	**1.06**

Table – 67: Case – 4: Quality of improvement in a six point Likert scale

Question	Quality of improvement in a six point Likert scale (Mean Value)						
	North	South	East	West	Central	North-East	Grand Mean
Skills of reading/writing an e-Mail	3.06	3.02	3.09	2.63	3.19	3.60	3.10

Table – 68: Case – 5: Frequency of usage of computer in a four point Likert scale

Question	Zones						
	North	South	East	West	Central	North-East	Grand Mean
Frequency of usage of computers	2.35	2.51	2.54	2.66	2.70	2.22	2.50

Table – 69: Case – 6: Difficulties faced during the training in a four point Likert scale

Question	Zones						
	North	South	East	West	Central	North-East	Grand Mean
Difficulties faced during the training	0.09	0.34	0.14	0	0.86	0.62	0.34

Table – 70: Case – 7: Purposes of using technology

Question	Zones						
	North	South	East	West	Central	North-East	Grand Mean
Purposes of using technology	8.59	7.80	10.06	11.45	15.56	19.86	

Table – 71: Ranking of the States

Heads	Ranking Order	Ranking
Case – 1	First	West
	Second	North
	Third	North-East
	Fourth	South
	Fifth	East
	Sixth	Central
Case – 2	First	East
	Second	Central
	Third	South West
	Fourth	North-East
	Fifth	North
Case – 3	First	North
	Second	West
	Third	East
	Fourth	North-East
	Fifth	Central
	Sixth	South
Case – 4	First	West
	Second	South
	Third	East
	Fourth	Central
	Fifth	North
	Sixth	North-East

Heads	Ranking Order	Ranking
Case – 5	First	North-East
	Second	North
	Third	South
	Fourth	East
	Fifth	West
	Sixth	Central
Case – 6	First	West
	Second	North
	Third	East
	Fourth	South
	Fifth	North-East
	Sixth	Central
Case – 7	First	North-East
	Second	Central
	Third	West
	Fourth	East
	Fifth	North
	Sixth	south

Thus, all the cases taken together, the position of the zones can be shown in a descending order with best performing state in the first position followed by second, third and so on for each of the 23 questions on which analysis was performed.

Analysis on purpose of attending the training

The respondents from all the professions across the six zones were asked to state the purpose for which they had attended the training. The values for the purpose of attending the training are as follows:

- To confidently use computers/ mobile phones / tablets / internet – 1
- To get a new job/ promotion in the existing job – 2
- To learn new skills online – 3
- Others – 4

Based on the response, the frequency of the most repeated purpose, i.e., the mode value, for each profession has been calculated. This is shown in the following table:

Table – 72: Frequency Value for each Profession

	Professions											
	Student	**Farmer**	**Trader**	**Service Sector Employee**	**Asha/Anganwadi Worker**	**Teacher**	**Government Servant**	**Self-Employed**	**Others**	**House Wife**	**Privae Sector Employee**	**Wage Labourer**
MODE Purpose of attending the training	1	1	1	1	1	1	11	1	1	1	11	1

Mean value has also been calculated on the details of the respondent collected through telephonic survey. Below shown are the results:

Table – 73: Case – 8: Percentage of beneficiaries (Mean Value)

	Zones					
	North	**South**	**East**	**West**	**Central**	**North-East**
Male	53.58	45.48	56.59	53.64	51.69	47.01
Female	46.42	54.51	43.40	46.34	48.30	52.99
Transgender	0	0	0	0.01	0	0
Total Mean	**33.33**	**33.33**	**33.33**	**33.33**	**33.33**	**33.33**

Table – 74: Case – 9: Age distribution of beneficiaries (%) (Mean Value)

Age Group	**Zones**																	
	North			**South**			**East**			**West**			**Central**			**North-East**		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
14-18	51.7	53.01	0	46.00	43.74	0	50.88	48.33	0	53.03	20.45	33.33	49.73	56.53	0	60.52	61.51	0
19-30	32.98	43.98	0	45.78	58.17	0	43.95	46.98	0	36.21	62.38	0	44.51	36.39	25	34.94	29.20	0
31-50	17.98	15.43	0	14.24	15.46	0	5.01	4.51	0	10.70	16.90	0	5.65	7.03	0	4.21	8.22	0
51-60	1.76	0	0	0.18	0.04	0	0.16	0.18	0	0.05	0.27	0	0.10	0.05	0	0.32	1.15	0
Total Mean	**27.10**			**27.95**			**16.67**			**19.44**			**18.75**			**16.67**		

Table – 75: Case – 10: Community distribution of beneficiaries (%) (Mean Value)

Community	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
General	53.32	56.93	0	38.16	51.41	0	42.40	43.48	0	53.66	53.32	33.33	22.16	27.98	0	27.21	22.59	0
OBC	15.26	15.59	0	48.62	39.86	20	40.73	40.53	0	22.36	23.19	0	51.15	48.73	0	4.43	11.61	0
SC	23.08	22.01	0	11.68	7.98	0	10.77	9.35	0	6.35	8.56	0	18.54	16.10	25	10.47	8.75	0
ST	8.35	5.47	0	1.53	0.74	0	6.09	6.63	0	17.62	14.93	0	8.15	7.18	0	57.89	57.05	0
Total Mean	**16.67**			**18.33**			**16.66**			**19.44**			**18.75**			**16.67**		

Table – 76: Case – 11: Qualification of beneficiaries (%) (Mean Value)

Qualification	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Graduate	4.45	5.11	0	10.10	20.17	0	8.60	6.17	0	1.99	27.87	0	10.39	7.74	0	10.74	11.09	0
ITI/Diploma	1.54	0.17	0	6.06	1.64	0	2.62	0.78	8.33	27.80	6.79		0.96	0.56	0	1.30	0	0
Upto 12th	78.86	75.86	0	67.43	57.27	20	67.46	69.26	16.67	53.11	42.40	0	79.08	79	25	80.65	79.02	0

Qualification	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Upto 7th	15.14	18.85	0	16.41	20.92	0	21.32	23.78	0.75	17.10	22.95	0	9.56	12.68	0	7.31	9.90	0
Total Mean	16.66			18.33			18.81			18.18			18.75			16.67		

Table – 77: Case – 12: Religion of beneficiaries (%) (Mean Value)

Religion	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Hindu	73.87	70.48	0	93.18	95.72	0	74.39	74.46	0	93.17	91.74	0	90.85	91.51	25	38.44	39.37	0
Muslim	20.85	23.78	0	28.57	3.43	0	1.19	22.81	0	5.34	6.66	33.33	8.25	7.77	0	6.12	3.63	0
Sikh	5.13	5.25	0	0.03	0	0	0.01	0	0	0.03	0	0	0.45	0.37	0	0.09	0.04	0
Christian	0.39	0.32	0	3.56	3.91	0	2.11	0.12	0	0.08	0	0	0.20	0	0	45.97	45.00	0
Jain	0.01	0.01	0	0.01	0.03	0	0	0	0	0	0	0	0.12	0.10	0	0	0.22	0
Parsi	0	0	0	0	0	0	0.13	0.11	0	0	0	0	0	0	0	0	0	0

Religion	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Buddhist	0	0.11	0	0	0	0	0	0	0	0	0.15	0	0.01	0.22	0	0.81	1.63	0
Others	0.12	0.03	0	0.02	0.04	0	1.21	0.43	0	1.36	1.44	0	0.11	0	0	8.61	11.13	0
Total Mean	8.35			9.52			7.37			9.72			9.37			8.38		

Table – 78: Case – 13: Profession of beneficiaries (%) (Mean Value)

Profession	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Student	65.98	69.16	0	63.91	50.25	0	80.87	73.67	33.33	70.08	68.22	33.33	76.63	78.11	25	77.14	77.82	0
Farmer	4.18	0.67	0	4.85	3.54	0	2.44	0.67	0	3.55	0.33	0	3.27	0.50	0	0.18	0	0
Trader	2.57	0.16	0	1.27	0.44	0	2.07	0.22	0	3.32	1.00	0	1.43	0.18	0	3.32	0.98	0
Service	8.17	1.39	0	6.60	2.50	0	0.94	0.27	0	4.38	5.26	0	1.64	0.74	0	0.76	0.55	0
ASHA	0.44	2.81	0	1.83	2.33	0	0.10	0.26	8.33	0.33	0.44	0	0.11	0.73	0	0	1.15	0

Profession	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Teacher	0.19	4.10	0	0.28	0.30	0	0.34	2.46	0	0.33	0.24	0	0.64	1.04	0	1.23	4.48	0
Govt.	0.16	0.08	0	0.35	0.11	0	0.35	0.20	0	0	0	0	0.59	0.27	0	1.02	0.96	0
Self-employed	8.38	6.21	0	10.81	15.31	0	7.91	4.10	0	8.42	7.02	0	8.73	2.21	0	10.15	2.98	0
Housewife	0	13.02	0	0	22.71	0	0	17.34	0	0	15.12	0	0	13.71	0	0	10.74	0
Private	4.21	0.39	0	5.93	1.42	0	1.92	0.37	0	3.60	0.77	0	3.49	1.27	0	1.63	0.11	0
Wage laborer	3.63	0.78	0	2.81	0.46	0	2.36	0.14	0	5.88	1.23	0	2.42	0.43	0	1.35	0	0
Others	2.23	1.12	0	1.35	0.62	0	0.70	0.29	0	0.31	0.53	0	1.04	0.80	0	3.39	0.17	0
Total Mean	**5.56**			**5.55**			**6.71**			**6.49**			**6.25**			**5.56**		

Table – 79: Case – 14: Type of beneficiaries (%) (Mean Value)

Type	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
BPL	11.74	13.25	0	53.92	52.87	0	26.11	29.94	16.67	26.64	5.89	0	24.15	25.97	25	5.23	6.06	0
Not BPL	88.26	86.75	0	46.08	47.13	20	73.88	70.06	0.75	73.36	46.34	33.33	75.84	74.03	0	94.77	93.94	0
Total Mean	33.33			36.67			36.23			30.93			37.50			33.33		

Table – 80: Case – 15: Usefulness of training to the beneficiaries (%) (Mean Value)

Usefulness	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Yes	99.57	71.52	0	99.75	99.72	0	99.67	99.62	25	99.79	99.77	0	99.27	99.03	25	82.94	84.68	0
No	0.43	28.48	0	0.25	0.28	0	0.33	0.38	0	0.21	0.23	0	0.72	0.97	0	17.06	15.32	0
Total Mean	33.33			33.33			37.50			33.33			37.50			33.33		

Table – 81: Case – 16: Duration of the training by beneficiaries (%) (Mean Value)

Duration	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Less than 7	1.36	5.35	0	1.91	1.06	0	0.66	1.36	0	1.06	13.88	0	0.98	1.15	0	4.82	2.54	0
7 – 10	13.07	15.56	0	3.41	4.44	0	14.52	0.66	0	23.79	25.09	33.33	3.27	4.52	0	4.34	5.61	0
10 – 20	61.49	55.30	0	56.83	59.72	10	22.97	5.12	0	37.27	11.98	0	28.41	27.09	0	16.08	18.13	0
20 – 30	19.74	20.05	0	27.55	24.41	10	37.29	66.16	25	17.42	11.98	0	52.34	51.87	25	60.48	57.75	0
30 & above	4.33	3.74	0	10.31	10.37	0	24.55	26.70	0	0.46	8.00	0	15.00	15.37	0	14.28	16.03	0
Ongoing	0	0	0	0	0	0	0	0	0	0	0.21	0	0	0	0	0	0	0
Total Mean	**11.11**			**12.22**			**12.50**			**10.25**			**12.50**			**11.11**		

Table – 82: Case – 17: After How Many Days of Training the Exam Was Conducted (%) (Mean Value)

Conduct of Exam	Zones																	
	North			South			East			West			Central			North-East		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Less than 7	18.26	17.70	0	9.72	6.05	0	22.76	21.97	16.67	26.38	25.31	0	20.65	18.84	0	27.13	29.35	0
8 – 15	28.06	29.47	0	50.03	38.24	0	32.23	45.24	0	10.95	20.04	0	59.98	62.67	25	33.11	31.89	0
16 – 30	21.20	19.96	0	19.08	39.20	10	12.42	14.65	0	4.10	10.04	0	15.16	14.62	0	31.36	31.98	0
More than 30	32.49	32.88	0	21.16	16.51	0	32.58	18.13	8.33	58.58	44.64	33.33	4.20	3.86	0	8.40	6.85	0
Total Mean	16.67			17.50			18.75			19.45			18.75			16.67		

Table – 83: Case- 18: Owning a computer by a family (%) (Mean Value)

Owning a Computer	Zones					
	North	South	East	West	Central	North-East
Yes	43.59	77.28	66.16	81.99	69.02	42.36
No	56.40	22.72	33.84	18.01	30.98	57.64
Total Mean	50	50	50	50	50	50

Spearman's Correlation Test

In this section, correlation test has been performed to find out the nature of impact of various independent variables on the level of confidence in using digital devices. The exercise has been done for all the six zones by using SAS analytical tool.

Case – 1

Dependent variable: Level of confidence in using digital devices after the training (Im_{confi})

Independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone (M_{Wi-Fi})
- Level of comfort in making video calls (M_{VC})
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/Crop Prices/Jobs etc. (Im_{access})
- Educating Others (family, friends etc.) about the use of IT (Im_{edu})
- Recommending the training to your family members / friends (Im_{rec})
- Nature of assessment ($Tr_{quality}$)

North Zone

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 84: Simple Statistics for North Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	11452	1.58881	0.75808	2.00000	0	4.00000
M_{Wi-Fi}	11452	1.37967	1.00758	2.00000	0	4.00000
M_{VC}	11452	1.49633	0.91298	2.00000	0	4.00000
Im_{access}	11452	1.47965	0.88211	2.00000	0	4.00000
Im_{edu}	11452	1.74048	1.05481	2.00000	0	4.00000
Im_{rec}	11452	1.57300	0.95447	2.00000	0	4.00000
$Tr_{quality}$	11452	1.61544	0.69533	2.00000	0	4.00000

Table – 85: Correlation Coefficient for North Zone

Spearman Correlation Coefficients, N = 11452, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.69690 <.0001	0.66055 <.0001	0.85559 <.0001	0.72253 <.0001	0.66633 <.0001	0.70263 <.0001

From the above analysis, it can be seen that the level of confidence in using digital devices after the training (Im_{confi}) is positively correlated with all the independent variables. However, the degree of positive correlation varies among the independent variables.

Im_{access} with a r value of 0.8559 implies that the ease of accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc., has the highest impact on the level of confidence in using digital devices after the training followed by the independent variable "Educating Others" and so on. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 86: Degree of Associaton among variables in North Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{access}	0.85559	Very Strong
	Im_{edu}	0.72253	Strong
	$Tr_{quality}$	0.70263	Strong
	M_{Wi-Fi}	0.69690	Strong
	Im_{rec}	0.66633	Strong
	M_{VC}	0.66055	Strong

Thus it can be said that table Im_{Access} is very strongly correlated and M_{VC} is least strongly correlated with the dependent variable.

South Zone

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 87: Simple Statistics for South Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	11071	1.84627	0.57124	2.00000	0	4.00000
M_{Wi-Fi}	11071	1.72261	1.08829	2.00000	0	4.00000
M_{VC}	11071	1.76073	0.85324	2.00000	0	4.00000
Im_{access}	11071	1.89107	0.71382	2.00000	0	4.00000
Im_{edu}	11071	1.95691	0.70323	2.00000	0	4.00000
Im_{rec}	11071	1.84979	0.66335	2.00000	0	4.00000
$Tr_{quality}$	11071	1.69777	0.64789	2.00000	0	4.00000

Table – 88: Correlation Coefficient for South Zone

Spearman Correlation Coefficients, N = 11071, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.43892 <.0001	0.33672 <.0001	0.86499 <.0001	0.78069 <.0001	0.71152 <.0001	0.60189 <.0001

In the south zone, all the independent variables are positively correlated with the dependent variable thereby implying that an increase in any of the independent variable will lead to an increase in the dependent variable and vice versa. The ease of accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/Jobs etc., has the highest impact on the level of confidence in using digital devices after the training. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 89: Degree of Association among Variables for South Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{access}	0.86499	Very Strong
	Im_{edu}	0.78069	Strong
	Im_{rec}	0.71152	Strong
	$Tr_{quality}$	0.60189	Strong
	M_{Wi-Fi}	0.43892	Moderate
	M_{VC}	0.33672	Moderate

East Zone

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 90: Simple Statistics for East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	12814	1.58506	0.58003	2.00000	0	4.00000
M_{Wi-Fi}	12814	1.37131	0.94471	2.00000	0	4.00000
M_{VC}	12814	1.52825	0.75776	2.00000	0	4.00000
Im_{access}	12814	1.53832	0.62197	2.00000	0	4.00000
Im_{edu}	12814	1.78594	0.90705	2.00000	0	4.00000
Im_{rec}	12814	1.61940	0.77495	1.00000	0	4.00000
$Tr_{quality}$	12814	1.62338	0.60979	2.00000	0	4.00000

Table – 91: Correlation Coefficient for East Zone

Spearman Correlation Coefficients, N = 12814, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.77501 <.0001	0.74530 <.0001	0.84358 <.0001	0.82363 <.0001	0.71745 <.0001	0.81541 <.0001

For the east zone, there exists a positive relation between the independent variables and the dependent variable with ease of accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/Jobs etc., having the highest impact on the level of confidence in using digital devices after the training. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table 92: Degree of Association among Variables for East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{access}	0.84358	Very Strong
	Im_{edu}	0.82363	Very Strong
	$Tr_{quality}$	0.81541	Very Strong
	M_{Wi-Fi}	0.77501	Strong
	M_{VC}	0.74530	Strong
	Im_{rec}	0.71745	Strong

West Zone

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 93: Simple Statistics for West Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	3118	1.36466	0.54868	1.00000	0	4.00000
M_{Wi-Fi}	3118	1.21232	0.97933	1.00000	0	4.00000
M_{VC}	3118	1.35728	0.94405	1.00000	0	4.00000
Im_{access}	3118	1.27133	1.25258	1.00000	0	4.00000
Im_{edu}	3118	1.49551	0.89583	1.00000	0	4.00000
Im_{rec}	3118	1.31302	0.49718	1.00000	0	4.00000
$Tr_{quality}$	3118	1.34894	0.58654	1.00000	0	4.00000

Table – 94: Correlation Coefficient for West Zone

Spearman Correlation Coefficients, N = 3118, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.43644 <.0001	0.39941 <.0001	0.68325 <.0001	0.77880 <.0001	0.80165 <.0001	0.74819 <.0001

In the west zone, a positive correlation exists between the dependent and the independent variables. However, the level of dependency of the level of confidence in using digital

devices after the training is highest on the independent variable "Recommending the training programme to your family members/friends".

The following table shows the degree of correlation among the dependent and the independent variables:

Table – 95: Degree of Association among Variables for West Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{rec}	0.80165	Very Strong
	Im_{edu}	0.77880	Strong
	$Tr_{quality}$	0.74819	Strong
	Im_{access}	0.68325	Strong
	M_{Wi-Fi}	0.43644	Moderate
	M_{VC}	0.39941	Moderate

Central Zone

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 96: Simple Statistics for Central Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	10123	1.55567	0.66894	1.00000	0	4.00000
M_{Wi-Fi}	10123	1.62373	0.87805	2.00000	0	4.00000
M_{VC}	10123	1.80352	1.10719	2.00000	0	4.00000
Im_{access}	10123	1.66067	0.99849	1.00000	0	4.00000
Im_{edu}	10123	1.42645	0.63830	1.00000	0	4.00000
Im_{rec}	10123	1.16823	0.98870	1.00000	0	4.00000
$Tr_{quality}$	10123	1.35592	0.84343	1.00000	0	4.00000

Table – 97: Correlation Coefficient for Central Zone

Spearman Correlation Coefficients, N = 10123, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.49166 <.0001	0.37170 <.0001	0.78987 <.0001	0.59784 <.0001	0.54102 <.0001	0.66616 <.0001

A positive relation among the dependent and the independent variables is also prevalent for the central zone. In this case, the level of comfort in making video calls has the highest impact on of the level of confidence in using digital devices after the training and the degree of correlation is shown below:

Table – 98: Degree of Association among Variables for Central Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{access}	0.78987	Strong
	$Tr_{quality}$	0.66616	Moderate
	Im_{edu}	0.59784	Moderate
	Im_{rec}	0.54102	Moderate
	M_{Wi-Fi}	0.49166	Moderate
	M_{VC}	0.37170	Moderate

North-East

1 With Variables:	Im_{confi}
6 Variables:	M_{Wi-Fi} M_{VC} Im_{access} Im_{edu} Im_{rec} $Tr_{quality}$

Table – 99: Simple Statistics for North-East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	1528	1.71073	0.80280	2.00000	0	4.00000
M_{Wi-Fi}	1528	1.47513	0.91950	2.00000	0	4.00000
M_{VC}	1528	1.56872	0.76206	1.00000	0	4.00000
Im_{access}	1528	1.43063	1.01806	2.00000	0	4.00000
Im_{edu}	1528	1.63351	1.02131	2.00000	0	4.00000
Im_{rec}	1528	1.60733	0.82860	1.00000	0	4.00000
$Tr_{quality}$	1528	1.64791	0.76967	1.00000	0	4.00000

Table – 100: Correlation Coefficient for North-East Zone

Spearman Correlation Coefficients, N = 1528, Prob > |r| under H0: Rho=0						
	M_{Wi-Fi}	M_{VC}	Im_{access}	Im_{edu}	Im_{rec}	$Tr_{quality}$
Im_{confi}	0.81042 <.0001	0.73619 <.0001	0.85156 <.0001	0.78269 <.0001	0.74034 <.0001	0.62321 <.0001

In north-east, the positive relation between the dependent and the independent variables continue to exist with ease of accessing website(s)/ portal(s) to search for Govt. Welfare

Schemes/ Crop Prices/Jobs etc. having the highest impact on the level of confidence in using digital devices after the training. Below table shows the degree of correlation:

Table – 101: Degree of Association among Variables for North-East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Im_{access}	0.85156	Very Strong
	M_{Wi-Fi}	0.81042	Very Strong
	Im_{edu}	0.78269	Strong
	Im_{rec}	0.74034	Strong
	M_{VC}	0.73619	Strong
	$Tr_{quality}$	0.62321	Strong

Thus based on the value of correlation for each of the independent variable, each of the six zones can be ranked in a descending order starting from the highest value. This is shown in the following table:

Table – 102: Rank of the Zones

Independent variables	Ranking Order	Rank of the Zones
M_{Wi-Fi}	First	North- East
	Second	East
	Third	North
	Fourth	Central
	Fifth	South
M_{VC}	First	North-East
	Second	North
	Third	West
	Fourth	Central
	Fifth	south
Im_{access}	First	South
	Second	North
	Third	North-East
	Fourth	East
	Fifth	Central
	Sixth	West
Im_{edu}	First	East
	Second	South
	Third	North
	Fourth	Central

Independent variables	Ranking Order	Rank of the Zones
Im_{rec}	First	West
	Second	North-East
	Third	East
	Fourth	South
	Fifth	North
	Sixth	Central
$Tr_{quality}$	First	East
	Second	West
	Third	North
	Fourth	Central
	Fifth	North-East
	Sixth	South

Case – 2

Dependent variable: Level of satisfaction with digital devices available during training ($TrSAT$)

Independent variables:

- Level of ease in using computers/laptops after training (Im_{CEASE})
- Level of ease in using mobiles after training (Im_{MEASE})

North Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 103: Simple Statistics for North Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Tr_{sat}	11452	2.25297	0.68583	2.00000	1.00000	5.00000
Im_{CEASE}	11452	2.40080	0.62257	2.00000	1.00000	5.00000
Im_{MEASE}	11452	2.16119	0.90518	2.00000	1.00000	5.00000

Table – 104: Correlation Coefficient for North Zone

Spearman Correlation Coefficients, N = 11452, Prob > |r| under H0: Rho=0		
	Im_{CEASE}	Im_{MEASE}
Tr_{sat}	0.45326 <.0001	0.28298 <.0001

From the above analysis, it has been seen that the level of satisfaction with digital devices available during training ($TrSAT$) is positively correlated with both the independent variables which means that higher the level of ease in using computers/laptops and mobiles after training, higher is the level of confidence in using digital devices after training. However, the degree of positive correlation varies among the independent variables. This is shown in the following table:

Table – 105: Degree of Association among Variables for North Zone

Dependent Variable	Independent Variables	r (value)	Degree
Tr_{sat}	Im_{CEASE}	0.45326	Moderate
	Im_{MEASE}	0.28298	Weak

South Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 106: Simple Statistics for South Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Tr_{sat}	11071	2.16485	0.61817	2.00000	1.00000	5.00000
Im_{CEASE}	11071	2.26285	0.54757	2.00000	1.00000	5.00000
Im_{MEASE}	11071	1.97597	0.40185	2.00000	1.00000	5.00000

Table – 107: Correlation Coefficient for South Zone

Spearman Correlation Coefficients, N = 11071, Prob > |r| under H0: Rho=0		
	Im_{CEASE}	Im_{MEASE}
Tr_{sat}	0.60370<.0001	0.02273<0.0168

The above analysis shows that the level of satisfaction with digital devices available during training ($TrSAT$) is positively correlated with both the independent variables which means that higher the level of ease in using computers/laptops and mobiles after training, higher is the level of confidence in using digital devices after training. This is shown in the following table:

Table – 108: Degree of Association among Variables for South Zone

Dependent Variable	Independent Variables	r (value)	Degree
Tr_{sat}	Im_{CEASE}	0.60370	Moderate
	Im_{MEASE}	0.02273	Weak

East Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 109: Simple Statistics for East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Tr_{sat}	12814	2.21118	0.63880	2.00000	1.00000	5.00000
Im_{CEASE}	12814	2.38161	0.61065	2.00000	1.00000	5.00000
Im_{MEASE}	12814	1.61620	0.62309	2.00000	1.00000	5.00000

Table – 110: Correlation Coefficient for East Zone

Spearman Correlation Coefficients, N = 12814, Prob > |r| under H0: Rho=0		
	Im_{CEASE}	Im_{MEASE}
Tr_{sat}	0.45526<.0001	-0.26309 <.0001

For the east zone, there exists a positive correlation between the level of satisfaction with digital devices available during training and the level of ease in using computers/laptops after training whereas a negative correlation exists between the level of satisfaction with digital devices available during training and the level of ease in using mobiles after training. The degree of correlation is shown in the following table:

Table – 111: Degree of Association among Variables for East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Tr_{sat}	Im_{CEASE}	0.45526	Moderate
	Im_{MEASE}	- 0.26309	Weak

West Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 112: Simple Statistics for West Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
$\boldsymbol{Tr_{sat}}$	3118	2.13278	0.59325	2.00000	1.00000	5.00000
$\boldsymbol{Im_{CEASE}}$	3118	2.32425	0.61455	2.00000	1.00000	5.00000
$\boldsymbol{Im_{MEASE}}$	3118	1.89256	0.38039	2.00000	1.00000	5.00000

Table – 113: Correlation Coefficient for East Zone

Spearman Correlation Coefficients, N = 3118, Prob > |r| under H0: Rho=0		
	$\boldsymbol{Im_{CEASE}}$	$\boldsymbol{Im_{MEASE}}$
$\boldsymbol{Tr_{sat}}$	0.11395 <.0001	0.20532 <.0001

In the west zone, the level of satisfaction with digital devices available during training (Tr_{SAT}) is positively correlated with both the independent variables which means that higher the level of ease in using computers/laptops and mobiles after training, higher is the level of confidence in using digital devices after training. However, the degree of positive correlation varies among the independent variables. This is shown in the following table:

Table – 114: Degree of Association among Variables for West Zone

Dependent Variable	Independent Variables	r (value)	Degree
$\boldsymbol{Tr_{sat}}$	Im_{CEASE}	0.20532	Weak
	Im_{MEASE}	0.11395	Weak

Central Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 115: Simple Statistics for Central Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Tr_{sat}	10123	1.87642	0.67956	2.00000	1.00000	5.00000
Im_{CEASE}	10123	2.49797	0.62269	3.00000	1.00000	5.00000
Im_{MEASE}	10123	1.91524	0.48320	2.00000	1.00000	5.00000

Table – 116: Correlation Coefficient for Central Zone

Spearman Correlation Coefficients, N = 10123, Prob > |r| under H0: Rho=0		
	Im_{CEASE}	Im_{MEASE}
Tr_{sat}	0.43667 <.0001	0.37374 <.0001

For the central zone, the level of satisfaction with digital devices available during training (Tr_{SAT}) is positively correlated with both the independent variables which means that higher the level of ease in using computers/laptops and mobiles after training, higher is the level of confidence in using digital devices after training. However, the degree of positive correlation varies among the independent variables. This is shown in the following table:

Table – 117: Degree of Association among Variables for Central Zone

Dependent Variable	Independent Variables	r (value)	Degree
Tr_{sat}	Im_{CEASE}	0.43667	Moderate
	Im_{MEASE}	0.37376	Moderate

North-East Zone

1 With Variables:	Tr_{sat}
2 Variables:	Im_{CEASE} Im_{MEASE}

Table – 118: Simple Statistics for North-East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Tr_{sat}	1528	2.16623	0.66525	2.00000	1.00000	5.00000
Im_{CEASE}	1528	2.34097	0.66897	2.00000	1.00000	5.00000
Im_{MEASE}	1528	1.96924	0.69968	2.00000	1.00000	5.00000

Table – 119: Correlation Coefficient for North-East Zone

Spearman Correlation Coefficients, N = 1528, Prob > |r| under H0: Rho=0		
	Im_{CEASE}	Im_{MEASE}
Tr_{sat}	0.20684 <.0001	0.16117 <.0001

For the north-east zone, the level of satisfaction with digital devices available during training (Tr_{SAT}) is positively correlated with both the independent variables which means that higher the level of ease in using computers/laptops and mobiles after training, higher is the level of confidence in using digital devices after training. However, the degree of positive correlation varies among the independent variables. This is shown in the following table:

Table – 120: Degree of Association among Variables for North-East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Tr_{sat}	Im_{CEASE}	0.20681	Weak
	Im_{MEASE}	0.16117	Weak

Thus based on the value of correlation for each of the independent variable, each of the six zones can be ranked in a descending order starting from the highest value. This is shown in the following table:

Table – 121: Rank of the Zones

Independent Variable	Ranking Order	Rank of the Zones
Im_{CEASE}	First	South
	Second	East, North
	Third	Central
	Fourth	North East
	Fifth	West
Im_{MEASE}	First	Central
	Second	North
	Third	West
	Fourth	North East
	Fifth	South
	Sixth	East

Case – 3

In this section, correlation test has been performed to find out the nature of impact of various independent variables on the level of confidence in using digital devices. The exercise has been done for all the six zones by using SAS analytical tool.

Dependent variables: Level of confidence in using digital devices after the training (Im_{confi})
Independent variables:

- Ease of accessing social networking sites (Tr_{EA})
- Reporting grievances to the local government using mobile/computer (Tr_{GRV})

North Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 122: Simple Statistics for North Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	11452	1.58881	0.75808	2.00000	0	4.00000
Tr_{EA}	11452	1.35828	0.90848	1.00000	0	4.00000
Tr_{GRV}	11452	0.45258	1.17298	0	0	4.00000

Table – 123: Correlation Coefficient for North Zone

Spearman Correlation Coefficients, N = 11452, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.63382 <.0001	0.13365 <.0001

From the above analysis, it can be seen that the level of confidence in using digital devices after the training is positively correlated with both the independent variables, thereby implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 124: Degree of Association among Variables for North Zone

Dependent Variable	**Independent Variables**	**r (value)**	**Degree**
Im_{confi}	Tr_{EA}	0.6338	Moderate
	Tr_{GRV}	0.13365	Weak

South Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 125: Simple Statistics for South Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	11071	1.84627	0.57124	2.00000	0	4.00000
Tr_{EA}	11071	1.73498	0.77590	2.00000	0	4.00000
Tr_{GRV}	11071	0.63599	1.28746	0	0	4.00000

Table – 126: Correlation Coefficient for South Zone

Spearman Correlation Coefficients, N = 11071, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.49662 <.0001	0.11869 <.0001

From the above analysis, it can be seen that the level of confidence in using digital devices after the training is positively correlated with both the independent variables, thereby implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 127: Degree of Association among Variables for South Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Tr_{EA}	0.49662	Moderate
	Tr_{GRV}	0.11869	Weak

East Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 128: Simple Statistics for East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	12814	1.58506	0.58003	2.00000	0	4.00000
Tr_{EA}	12814	1.40144	0.78556	2.00000	0	4.00000
Tr_{GRV}	12814	0.41236	1.13579	0	0	4.00000

Table – 129: Correlation Coefficient for East Zone

Spearman Correlation Coefficients, N = 12814, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.73894<.0001	0.13776<.0001

In the east zone, a positive correlation exists between the dependent variable and the independent variables, thus implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 130: Degree of Association among Variables for East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Tr_{EA}	0.73894	Moderate
	Tr_{GRV}	0.13776	Weak

West Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 131: Simple Statistics for West Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	3118	1.36466	0.54868	1.00000	0	4.00000
Tr_{EA}	3118	1.12893	1.07471	1.00000	0	4.00000
Tr_{GRV}	3118	0.50449	1.24165	0	0	4.00000

Table – 132: Correlation Coefficient for West Zone

Spearman Correlation Coefficients, N = 3118, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.48145 <.0001	0.20689 <.0001

In the west zone, a positive correlation exists between the dependent variable and the independent variables, thus implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 133: Degree of Association among Variables for West Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Tr_{EA}	0.48145	Moderate
	Tr_{GRV}	0.20689	Weak

Central Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 134: Simple Statistics for Central Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	10123	1.55567	0.66894	1.00000	0	4.00000
Tr_{EA}	10123	1.23076	0.85855	1.00000	0	4.00000
Tr_{GRV}	10123	0.14630	0.69962	0	0	4.00000

Table – 135: Correlation Coefficient for Central Zone

Spearman Correlation Coefficients, N = 10123, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.51606 <.0001	0.02364<0.0174

In the central zone, a positive correlation exists between the dependent variable and the independent variables, thus implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 136: Degree of Association among Variables for Central Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Tr_{EA}	0.51606	Moderate
	Tr_{GRV}	0.02364	Weak

North-East Zone

1 With Variables:	Im_{confi}
2 Variables:	Tr_{EA} Tr_{GRV}

Table – 137: Simple Statistics for North-East Zone

Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Median**	**Minimum**	**Maximum**
Im_{confi}	1528	1.71073	0.80280	2.00000	0	4.00000
Tr_{EA}	1528	1.40576	0.84968	1.00000	0	4.00000
Tr_{GRV}	1528	0.53469	1.31142	0	0	4.00000

Table – 138: Correlation Coefficient for North-East Zone

Spearman Correlation Coefficients, N = 1528, Prob > |r| under H0: Rho=0		
	Tr_{EA}	Tr_{GRV}
Im_{confi}	0.74336 <.0001	0.13677 <.0001

In the north-east, a positive correlation exists between the dependent variable and the independent variables, thus implying that higher the use of social networking sites and higher the level of reporting grievances to the local government using mobile/computer, higher is the level of confidence in using digital devices after the training. However, the degree of positive correlation varies among the independent variables. The degree of positive correlation of the independent variables with the dependent variable is shown in the following table:

Table – 139: Degree of Association among Variables for North-East Zone

Dependent Variable	Independent Variables	r (value)	Degree
Im_{confi}	Tr_{EA}	0.74336	Moderate
	Tr_{GRV}	0.13677	Weak

Thus based on the value of correlation for each of the independent variable, each of the six zones can be ranked in a descending order starting from the highest value. This is shown in the following table:

Table – 140: Ranking of the Zones

Independent Variable	Ranking Order	Rank of the Zones
Tr_{EA}	First	North-East
	Second	East
	Third	North
	Fourth	Central
	Fifth	South
	Sixth	West
Tr_{GRV}	First	West
	Second	North East
	Third	North-East
	Fourth	South
	Fifth	Central

Regression Analysis

Case – 1

In the study, regression analysis has been performed for each of the six zones, keeping the dependent variable and the set of independent variables same as before.

Dependent variable: Level of confidence in using digital devices after the training (Im_{confi})

Independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone (M_{Wi-Fi})
- Level of comfort in making video calls (M_{VC})
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/Jobs etc. (Im_{access})
- Educating Others (family, friends etc.) about the use of IT (Im_{edu})
- Recommending the training to your family members / friends (Im_{rec})
- Nature of assessment ($Tr_{quality}$)

North Zone

Table – 141: R-Square Value for North Zone

Dependent Variable: Im_{confi}

Root MSE	0.37748	**R-Square**	0.7522
Dependent Mean	1.58881	**Adj R-Sq**	0.7521
Coeff Var	23.75855		

Table – 142: Parameter Estimates for North Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.24385	0.00971	25.11	<.0001
M_{Wi-Fi}	1	0.03919	0.00748	5.24	<.0001
M_{VC}	1	0.09567	0.00777	12.32	<.0001
Im_{access}	1	0.47378	0.00644	73.57	<.0001
Im_{edu}	1	0.09481	0.00578	16.41	<.0001
Im_{rec}	1	-0.01277	0.00610	-2.09	0.0362
$Tr_{quality}$	1	0.18681	0.00651	28.68	<.0001

From the above tables, it can be seen that the R-square value is 0.7522 which indicates a strong dependency of the dependent variable on the independent variables. From the Parameter estimate, it is observed that the level of comfort in using digital devices after training will increase if there is an increase in any of the following independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Level of comfort in making video calls (Skype, Hangout etc.)
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT
- Nature of assessment

However, that the level of confidence in using digital devices after training will increase if there is a decrease in the independent variable "Recommending the training to your family members / friends"

South Zone

Table – 143: R-Square Value for South Zone

Dependent Variable: Im_{confi}

Root MSE	0.29127	**R-Square**	0.7402
Dependent Mean	1.84627	**Adj R-Sq**	0.7400
Coeff Var	15.77615		

Table – 144: Parameter Estimates for South Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.37157	0.01102	33.71	<.0001
M_{Wi-Fi}	1	0.09106	0.00533	17.09	<.0001
M_{VC}	1	-0.05884	0.00645	-9.12	<.0001
Im_{access}	1	0.40418	0.00629	64.22	<.0001
Im_{edu}	1	0.11256	0.00725	15.52	<.0001
Im_{rec}	1	0.07860	0.00663	11.86	<.0001
$Tr_{quality}$	1	0.17166	0.00523	32.83	<.0001

In the south zone, there exists a strong dependency of the dependent variable on the independent variables. From the Parameter estimate, it is observed that the level of confidence in using digital devices after training will increase if there is an increase in any of the following independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT
- Recommending the training to your family members / friends
- Nature of assessment

However, that the level of confidence in using digital devices after training will increase if there is a decrease in the independent variable "Level of comfort in making video calls (Skype, Hangout etc.)

East Zone

Table – 145: R-Square Value for East Zone

Dependent Variable: Im_{confi}

Root MSE	0.27286	**R-Square**	0.7788
Dependent Mean	1.58506	**Adj R-Sq**	0.7787
Coeff Var	17.21474		

Table – 146: Parameter Estimates for East Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.26045	0.00786	33.15	<.0001
M_{Wi-Fi}	1	0.09535	0.00500	19.06	<.0001
M_{VC}	1	0.02650	0.00573	4.62	<.0001
Im_{access}	1	0.37710	0.00687	54.85	<.0001
Im_{edu}	1	0.09345	0.00405	23.06	<.0001
Im_{rec}	1	0.02966	0.00444	6.69	<.0001
$Tr_{quality}$	1	0.22074	0.00637	34.64	<.0001

In the east zone, the R-square value is 0.7788 which indicates a strong dependency of dependent variable on the independent variables. It may be noted from the Parameter estimate that the level of confidence in using digital devices after training will increase if there is an increase in any of the following independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Level of comfort in making video calls (Skype, Hangout etc.)
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT
- Recommending the training to your family members / friends
- Nature of assessment

West Zone

Table – 147: R-Square Value for West Zone

Dependent Variable: Im_{confi}

Root MSE	0.29968	**R-Square**	0.7023
Dependent Mean	1.36466	**Adj R-Sq**	0.7017
Coeff Var	21.96005		

Table – 148: Parameter Estimate for West Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.24160	0.01764	13.69	<.0001
M_{Wi-Fi}	1	0.04812	0.01009	4.77	<.0001
M_{VC}	1	-0.04497	0.01012	-4.45	<.0001
Im_{access}	1	0.07336	0.00681	10.77	<.0001
Im_{edu}	1	0.09211	0.00898	10.26	<.0001
Im_{rec}	1	0.34848	0.01821	19.14	<.0001
$Tr_{quality}$	1	0.32409	0.01227	26.42	<.0001

For the west zone, an increase in the following independent variables lead to an increase in the level of confidence in using digital devices after training:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT

- Recommending the training to your family members / friends
- Nature of assessment

However, that the level of confidence in using digital devices after training will increase if there is a decrease in the independent variable "Level of comfort in making video calls (Skype, Hangout etc.)

Central Zone

Table – 149: R-Square Value for Central Zone

Dependent Variable: Im_{confi}

Root MSE	0.50076	**R-Square**	0.7401
Dependent Mean	1.15610	**Adj R-Sq**	0.7398
Coeff Var	43.31517		

Table – 150: Parameter Estimates for Central Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	-0.54283	0.02110	-25.73	<.0001
M_{Wi-Fi}	1	0.88598	0.00901	98.37	<.0001
M_{VC}	1	0.19340	0.01129	17.14	<.0001
Im_{access}	1	0.03620	0.01262	2.87	0.0041
Im_{edu}	1	0.01137	0.01291	0.88	0.3787
Im_{rec}	1	0.02266	0.01430	1.59	0.1130
$Tr_{quality}$	1	0.05076	0.01308	3.88	0.0001

In the central zone an increase in any of the following independent variables lead to an increase in the level of confidence in using digital devices after training:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Level of comfort in making video calls (Skype, Hangout etc.)
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT
- Recommending the training to your family members / friends
- Nature of assessment

North-East Zone

Table – 151: R-Square Value for North-East Zone

Dependent Variable: Im_{confi}

Root MSE	0.41408	**R-Square**	0.7350
Dependent Mean	1.71073	**Adj R-Sq**	0.7340
Coeff Var	24.20473		

Table – 152: Parameter Estimates for North-East Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.38432	0.02938	13.08	<.0001
M_{Wi-Fi}	1	0.14914	0.02277	6.55	<.0001
M_{VC}	1	0.11634	0.02285	5.09	<.0001
Im_{access}	1	0.36373	0.02060	17.65	<.0001
Im_{edu}	1	0.01741	0.02081	0.84	0.4030
Im_{rec}	1	0.06144	0.02185	2.81	0.0050
$Tr_{quality}$	1	0.16770	0.01713	9.79	<.0001

For the north-east, the level of confidence in using digital devices after training will increase among the beneficiaries with an increase in any of the following independent variables:

- Level of comfort in connecting Wi-Fi in Smart Phone
- Level of comfort in making video calls (Skype, Hangout etc.)
- Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/ Jobs etc.
- Educating Others (family, friends etc.) about the use of IT
- Recommending the training to your family members / friends
- Nature of assessment

Thus type of impact of each of the independent variable on the dependent variable for all the six zones taken together can be represented in a single table as shown below:

Table – 153: Scale of Impact

Independent Variable	Scale of impact					
	North	**South**	**East**	**West**	**Central**	**North-East**
M_{Wi-Fi}	Direct	Direct	Direct	Direct	Direct	Direct
M_{VC}	Direct	Indirect	Direct	Indirect	Direct	Direct
Im_{access}	Direct	Direct	Direct	Direct	Direct	Direct
Im_{edu}	Direct	Direct	Direct	Direct	Direct	Direct
Im_{rec}	Indirect	Direct	Direct	Direct	Direct	Direct
$Tr_{quality}$	Direct	Direct	Direct	Direct	Direct	Direct

Case – 2

Dependent variable: Level of satisfaction with computer /laptops/mobiles available during training (Tr_{sat}).

Independent variables:

- Level of ease in using computer after training (Im_{CEASE})
- Level of ease in using mobile after the training (Im_{MEASE})

North Zone

Table – 154: R-Square Value for North Zone

Dependent variable Tr_{sat}

Root MSE	0.62400	**R-Square**	0.1723
Dependent Mean	2.25297	**Adj R-Sq**	0.1722
Coeff Var	27.69658		

Table – 155: Parameter Estimates for North Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.09612	0.02453	44.68	<.0001
Im_{CEASE}	1	0.35533	0.00977	36.38	<.0001
Im_{MEASE}	1	0.14056	0.00672	20.93	<.0001

From the above tables, it can be seen that the R-square value is 0.1733 which indicates a weak dependency of the dependent variable on the independent variables. Parameter estimate indicates that a direct relation between the variables, thus implying that a unit increase in any of the independent variable will result in an unit increase on the dependent variable.

South Zone

Table – 156: R-Square Value for South Zone

Dependent variable Tr_{sat}

Root MSE	0.51186	**R-Square**	0.3145
Dependent Mean	2.16485	**Adj R-Sq**	0.3144
Coeff Var	23.64401		

Table – 157: Parameter Estimates for South Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.14102	0.02794	40.83	<.0001
Im_{CEASE}	1	0.66281	0.00931	71.22	<.0001
Im_{MEASE}	1	-0.24090	0.01268	-19.00	<.0001

From the above table, in south zone, it can be seen that the R-square value is 0.3145 which indicates moderate dependency of the dependent variable on the independent variables. Parameter estimate indicates that a direct relation exists between Tr_{sat} and Im_{CEASE} , thus implying that a unit increase in the independent variable will result in a unit increase on the dependent variable. However, there exists an inverse relation between Tr_{sat} and Im_{MEASE} thereby implying that an increase in Tr_{sat} will result in a decrease in. Im_{MEASE}..

East Zone

Table – 158: R-Square Value for East Zone

Dependent variable: Tr_{sat}

Root MSE	0.58477	**R-Square**	0.1621
Dependent Mean	2.21118	**Adj R-Sq**	0.1620
Coeff Var	26.44610		

Table – 159: Parameter Estimates for East Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.45697	0.02957	49.27	<.0001
Im_{CEASE}	1	0.38043	0.00894	42.57	<.0001
Im_{MEASE}	1	-0.09394	0.00876	-10.73	<.0001

For the east zone, zone it can be seen that the R-square value is 0.1621 which indicates weak dependency of the dependent variable on the independent variables. The independent variable, Im_{CEASE}, is directly related with the dependent variable whereas the other independent variable, Im_{MEASE}, is inversely related with the dependent variable.

West Zone

Table – 160: R-Square Value for West Zone

Dependent variable Tr_{sat}

Root MSE	0.57964	**R-Square**	0.0460
Dependent Mean	2.13278	**Adj R-Sq**	0.0454
Coeff Var	27.17773		

Table – 161: Parameter Estimates for West Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.35989	0.06399	21.25	<.0001
Im_{CEASE}	1	0.12656	0.01692	7.48	<.0001
Im_{MEASE}	1	0.25296	0.02734	9.25	<.0001

In the west zone, from the above table it is seen R-square value is 0.0460 which indicates a very weak dependency of dependent variable on independent variables. The dependent variable, Tr_{sat} , is directly related with both the independent variables.

Central Zone

Table – 162: R-Square Value for Central Zone

Dependent variable Tr_{sat}

Root MSE	0.61382	**R-Square**	0.1843
Dependent Mean	1.87642	**Adj R-Sq**	0.1841
Coeff Var	32.71205		

Table – 163: Parameter Estimates for Central Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	0.53550	0.02921	18.34	<.0001
Im_{CEASE}	1	0.35867	0.01098	32.67	<.0001
Im_{MEASE}	1	0.23233	0.01415	16.42	<.0001

In the central zone, from the above table, it is seen R-square value is 0.1841 which indicates a weak dependency of dependent variable on independent variables. The dependent variable, Tr_{sat} is directly related with both the independent variables.

North-East Zone

Table – 164: R-Square Value for North-East Zone

Dependent variable Tr_{sat}

Root MSE	0.65699	**R-Square**	0.0259
Dependent Mean	2.16623	**Adj R-Sq**	0.0247
Coeff Var	30.32883		

Table – 165: Parameter Estimates for North-East Zone

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.73433	0.06983	24.84	<.0001
Im_{CEASE}	1	0.11716	0.02596	4.51	<.0001
Im_{MEASE}	1	0.08004	0.02482	3.22	0.0013

The above table for the north-east zone indicates that the R-square value is 0.0259 which implies a weak dependency of dependent variable on independent variables. Parameter estimate indicates that an unit increase in any of the independent variables will result in an increase in the dependent variable.

Thus, type of impact of each of the independent variable on the dependent variable for all the six zones taken together can be represented in a single table as shown below:

Table – 166: Scale of Impact

Independent Variable	**Scale of impact**					
	North	**South**	**East**	**West**	**Central**	**North-East**
Im_{CEASE}	Direct	Direct	Direct	Direct	Direct	Direct
Im_{MEASE}	Direct	Indirect	Indirect	Direct	Direct	Direct

ANOVA (single factor) Test – Level of confidence in using digital devices after training on various age groups

In this section, ANOVA test has been performed for all the six zones to understand the level of confidence in using digital devices after the training on various age groups of the respondents. Two hypotheses has been developed to test their acceptance or rejection:

Null Hypothesis: there exist no difference in level of confidence in using digital devices after the training between the age groups.

Alternative Hypothesis: there exists significant difference in level of confidence in using digital devices after the training between the age groups.

Below mentioned are the values of the level of confidence in using digital devices after the training:

- Highly confident = 1
- Confident = 2
- Not so confident = 3
- Non-confident = 4
- Highly Non-confident = 0

North Zone

Anova: Single Factor

Table – 167: Summary for North Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	5027	1.604138	0.442148	0.664942
19-30	5308	1.555388	0.686021	0.828264
31-50	998	1.681363	0.672691	0.820178
50-60	119	1.655462	0.261644	0.511511

Table – 168: P-Value for North Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	16.18772	3	5.395908	9.410067	3.3E-06	2.605685
Within Groups	6564.497	11448	0.573419			
Total	6580.685	11451				

P-value=0.000003

The above analysis depicts that the level of confidence in using digital devices after training lies between "Highly confident" and "Confident" for the respondents from all the age groups. A lower value indicates the higher level of confidence. Thus the age group 19-30 has the highest level of confidence in using digital devices after training followed by the age groups 14-18, 50-60 and 31-50 respectively. However, the variation in the responses is higher (0.8282) within the age group of 19 – 30 whereas it is low (0.5115) within the age group of 50 – 60. In above ANOVA table p-value is less than alpha value (95% level of confidence) is 1.5 (i.e p-value 0.000003), which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups.

South Zone

Anova: Single factor

Table – 169: Summary for South Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	6071	1.839071	0.321544	0.567049
19-30	4040	1.837376	0.278821	0.528035
31-50	949	1.935722	0.547552	0.739967
50-60	11	1.363636	0.454545	0.6742

Table – 170: P-Value for South Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	10.790025	3	3.596675	11.05201	3.06E-07	2.605711
Within Groups	3601.553	11067	0.325432			
Total	3612.3431	11070				

P-value=0.0000003

The above tables indicate that the average level of confidence in using digital devices after training for all the age groups lie between “Highly confident” and “Confident” with the age group 50 – 60 where it is almost highly confident followed by the age groups 19 – 30, 14 – 18 and 31 – 50 respectively. The variation in response within the age group is high (0.7399) for 31 – 50 and low (0.5280) for 19 – 30. In above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05 (i.e p-value 0.00000036), which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups.

East Zone

Anova: Single Factor

Table – 171: Summary for East Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	5813	1.699983	0.268543	0.518211
19-30	5920	1.528209	0.358386	0.598654
31-50	998	1.306613	0.3412	0.584123
50-60	83	0.939759	0.984132	0.992034

Table – 172: P-Value for East Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	207.8469	3	69.28231	216.3102	6.9E-137	2.605602
Within Groups	4102.934	12810	0.320292			
Total	4310.781	12813				

P-value 6.9E-137

In the east zone, the average level of confidence in using digital devices after training tends to almost "Highly Confident" for the age group 50 – 60 while it lies between "Highly confident" and "Confident" in a descending order for the age groups 31 – 50, 19 – 30 and 14 – 18 respectively. The variation in response within the same age group is lowest (0.5182) for 14 – 18 and highest (0.9920) for 50 – 60. In above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05, which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups. However, the p value is so small it can be said that the existing difference in level of confidence in using digital devices after the training for various age groups is negligible.

West Zone

Anova: Single Factor

Table – 173: Summary for West Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	616	1.707792	0.236427	0.486238
19-30	1946	1.264645	0.25949	0.509401
31-50	550	1.325455	0.340152	0.583226
50-60	6	2.166667	0.966667	0.983192

Table – 174: P-Value for West Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	96.69801	3	32.23267	119.2516	4.16E-73	2.607762
Within Groups	841.6872	3114	0.270291			
Total	938.3852	3117				

P-value=4.16E-73

In the west zone, the average level of confidence in using digital devices after training is between “Highly confident” and “Confident” in a descending order for the age groups 19 – 30, 31 – 50 and 14 – 18 respectively. However, for the age group 50 – 60 where the average value lies between “Confident” and “Not so confident”. However, the variation in response within the same age group is high (0.9831) for 50 – 60 and low (0.4862) for 14 – 18. In above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05, which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups. However, the p value is so small it can be said that the existing difference in level of confidence in using digital devices after the training for various age groups is negligible.

Central Zone

Anova : Single Factor

Table – 175: Summary for Central Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	6133	1.587804	0.478142	0.691478
19-30	3434	1.498835	0.356684	0.59723
31-50	543	1.550645	0.639036	0.799397
50-60	13	1.615385	0.75641	0.869718

Table – 176: P-Value for Central Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	17.48534	3	5.828447	13.07167	1.62E-08	2.605787
Within Groups	4511.897	10119	0.445884			
Total	4529.383	10122				

P-VALUE=1.62E-08

In the central zone, the average level of confidence in using digital devices after training is between “Highly confident” and “Confident” for all the age groups with 19 – 30 showing the highest level of confidence followed by 31 – 50, 14 – 18 and 50 – 60 respectively. The age group 50 – 60 has the highest variation (0.869718) in response and the age group 19 – 30 having the lowest variation (0.5972) in response. In the above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05 which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups.

North-East

Anova: Single Factor

Table – 177: Summary for North-East Zone

SUMMARY				
Age Groups	*Count*	*Average*	*Variance*	*Sd*
14-18	908	1.77533	0.699192	0.836177
19-30	522	1.670498	0.493907	0.702785
31-50	93	1.333333	0.789855	0.888738
50-60	5	1.2	0.2	0.447214

Table – 178: P-Value for North-East Zone

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	19.18424	3	6.394747	10.09948	1.37E-06	2.610741
Within Groups	964.9597	1524	0.633176			
Total	984.144	1527				

P-value=0.0000013

In the north-east, the average level of confidence in using digital devices after training is between “Highly confident” and “Confident” for all the age groups with the age group 50 – 60 showing the highest level of confidence followed by 31 – 50, 19 – 30 and 14 – 18 respectively. The age group 31 – 50 is having the highest variation (0.88873) in response and the age group 50 – 60 is having the lowest variation (0.4472) in response. In the above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05 which means that the null hypothesis will be rejected. Thus there exists a difference in level of confidence in using digital devices after the training between the age groups.

Thus the above analysis for all the six zones can be shown in a single table as below:

Table – 179: Range of Response Level: Level of confidence in using digital devices after training of various age groups

Age Group	Range of Response				
	Highly Confident	Confident	Not so confident	Non-confident	Highly Nonconfident
North Zone					
14 – 18					
19 – 30					
31 – 50					
51 – 60					
South Zone					
14 – 18					
19 – 30					
31 – 50					
51 – 60					
East Zone					
14 – 18					
19 – 30					
31 – 50					
51 – 60					
West Zone					
14 – 18					
19 – 30					
31 – 50					
51 – 60					
Central Zone					
14 – 18					

Age Group	Range of Response				
	Highly Confident	**Confident**	**Not so confident**	**Non-confident**	**Highly Nonconfident**
19 – 30					
31 – 50					
51 – 60					
North-East					
14 – 18					
19 – 30					
31 – 50					
51 – 60					

The shaded region in the above table represents the area where the average level of confidence in using digital devices after training lies.

ANOVA (single factor) Test – Purpose of using technology by the respondents from various professions

Following hypotheses have been developed:

Null Hypothesis: there exists no difference in mean purpose of using technology among the respondents with various professions

Alternative Hypothesis: there exists significant difference in mean purpose of using technology among the respondents with various professions

Below mentioned are the values for the purpose of using technology Te_{PUR}:

- Agriculture market price information = 1
- Utility bill payment (Ticket booking / online recharge) online banking = 2
- Getting information about education and employment opportunities = 3
- Weather information = 4
- Accessing Govt websites/ filling online application (pan card /passport) = 5
- Other = 6

Table – 180: Mean Value for Purpose of Using Technology

Purpose of using technology (mean value)												
Profession → / **Zones ↓**	**Student**	**Farmer**	**Traders**	**Service Sector Employee**	**Asha/ Anganwadi Worker**	**Teacher**	**Government Servants**	**Self-Employed**	**Others**	**House Wifes**	**Private Sector Employees**	**Wage Labourers**
North	9.76	4.01	8.91	7.32	12.41	14.44	14.83	11.21	4.6	9.06	11.09	5.72
South	7.84	4.15	7.23	9.51	5.63	8.49	18.7	8.45	9.96	6.91	14.49	10.55
East	21.45	12.15	17.71	20.52	21.07	28.71	22.15	29.78	17.18	18.44	16.22	4.88
West	20.04	15.95	26.96	19.88	16.95	36.5	7	17.9	12.45	14.55	28.73	12.71
Central	8.92	8.87	10.78	12.21	9.2	25.58	30.24	16.82	12.18	7.98	20.64	8.31
North East	15.56	5.51	24.11	20.87	17.76	29.06	28.3	20.4	21.82	16.2	22.72	6

The above table depicts the mean purpose of using technology for the students and housewives across all the six zones vary between 7 and 22 (minimum value – 7.84, maximum value – 21.45) which means that they have used technology after the training mainly for a combination of two purposes. For the farmers, ASHA/Anganwadi workers and wage labourers, the mean purpose of using technology ranges between 4 and 16

(minimum value – 4.01, maximum value – 15.95) and 5 and 22 (minimum value – 5.63, maximum value – 21.07) respectively indicating the use of technology either for a single purpose or for a combination of two purposes. Traders, Govt. servants, private sector employees and self- employed respondents have used the technology either for a combination of two or three purposes. Service sector employees have used technology for a combination of two purposes. This can be represented in the following table:

Table – 181: Purpose of Using Technology for different Professions

Sl. No	Profession	Purpose of using technology (Mean value)		Purpose
		Max	Min	
1.	Student	21.45	7.84	Double
2.	Service Sector Employees	20.87	7.32	
3.	Farmers	15.95	4.01	Single/Double
4.	ASHA/Anganwadi Workers	21.07	5.63	
5.	Others	21.82	4.60	
6.	Housewife's	18.44	6.91	
7.	Wage laborer's	12.71	4.88	
8.	Traders	26.96	7.23	Double/Triple
9.	Teacher	36.50	8.49	
10.	Govt. servant	30.24	7.00	
11.	Self-employed	29.78	8.45	
12.	Private sector employees	28.73	11.09	

Anova: Single Factor

Table – 182: Summary

SUMMARY				
Professions Groups	*Zones*	*Sum*	*Average*	*Variance*
1	6	83.57	13.92833	35.2233
2	6	50.64	8.44	23.3926
3	6	95.7	15.95	68.64644
4	6	90.31	15.05167	37.12646
5	6	83.02	13.83667	33.65799
6	6	142.78	23.79667	107.6479
7	6	121.22	20.20333	75.10819
8	6	104.56	17.42667	56.25303
9	6	78.19	13.03167	35.20706
10	6	73.14	12.19	23.22232
11	6	113.89	18.98167	40.3671
12	6	48.17	8.028333	9.542137

Table – 183: P-Value

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1397.707	11	127.0643	2.795722	0.005289	1.952212
Within Groups	2726.973	60	45.44955			

In the above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05 and f value is greater than f critical value which means that the null hypothesis will be rejected and alternative hypothesis will be accepted thereby implying that there exists significant difference in mean purpose of using technology among the respondents with various professions.

ANOVA (single factor) Test – Purpose of using technology by the respondents from various age groups

Following hypotheses have been developed:

Null Hypothesis: there exists no significant difference in mean purpose of using technology among the respondents with various age groups

Alternative Hypothesis: there exists significant difference in mean purpose of using technology among the respondents with various age groups**.**

Below mentioned are the age groups as specified in the questionnaire:

- 14-18
- 19-30
- 31-50
- 50-60

Table – 184: Zone-wise Mean Value for Purpose of Using Technology

Purpose of using technology (Mean value)				
Age Group → / **Zone ↓**	**14-18**	**19-30**	**31-50**	**50-60**
North	9.14	9.99	8.46	13.47
South	5.79	11.44	5.07	5.09
East	15.01	28.58	17.92	12.85
West	13.48	21.99	16.5	7.5
Central	7.32	13.72	12.27	10.46
North-East	15.5	17.04	22.73	13.6

The above table shows that the respondents from the age group of 14-18 have used the technology either for a combination of two or three purposes. Respondents from the age group of 19-30 have used the technology for a combination of either two or three purposes. Respondents from the age group of 31-50 have used the technology either for a single purpose or for a combination of either two or three purposes. Respondents from the age group of 50-60 have used the technology either for a single purpose or for a combination of two purposes. This has been represented in the following table:

Table – 185: Purpose of Using Technology for different Age Groups

Sl. No	Age Group	Purpose of using technology (Mean value)		Purpose
		Max	Min	
1.	14-18	15.50	5.79	Single/Double
2.	50-60	13.60	5.09	Single/Double
3.	19-30	28.58	9.99	Double/Triple
4.	31-50	22.73	5.07	Single/Double/Triple

Anova: Single Factor

Table – 186: Summary

SUMMARY				
Age Groups	*Zones*	*Sum*	*Average*	*Variance*
14-18	6	66.24	11.04	17.3234
19-30	6	102.76	17.12667	49.94279
31-50	6	82.95	13.825	42.21499
50-60	6	62.97	10.495	12.44459

Table – 187: P-Value

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	166.6045	3	55.53483	1.821923	0.175646	3.098391
Within Groups	609.6288	20	30.48144			
Total	776.2333	23				

From the above ANOVA table, it can be seen that the p-value is greater than alpha value (95% level of confidence) is 0.05 and f value is less than f critical value thereby implying that the null hypothesis will be accepted, i.e., there exists no significant difference in mean purpose of using technology among the respondents of various age groups.

ANOVA (single factor) Test – Level of confidence in using digital devices after training for the respondents of various professions

Following hypotheses have been developed:

Null Hypothesis: there exists no significant difference in mean level of confidence in using digital devices after the training between the respondents of various professions

Alternative Hypothesis: there exists significant difference in mean level of confidence in using digital devices after the training between the respondents of various professions.

Below mentioned are the values of the level of confidence in using digital devices after the training:

- Highly confident = 1
- Confident = 2
- Not so confident = 3
- Unconfident = 4
- Highly unconfident = 0

The values assigned to each of the profession as mentioned in the questionnaire is given below:

- Student = 1
- Farmer = 2
- Trader = 3
- Service sector Employee = 4
- Asha /Anganwadi workers = 5
- Teachers = 6
- Government servants = 7
- Self-employment (VLES and small-scale entrepreneurs) = 8
- Others = 9
- Housewife = 10
- Private sector Employees = 11
- Wage Laborer's = 12

Anova : Single Factor

Table – 188: Summary

SUMMARY					
Profession	*Zones*	*Sum*	*Average*	*Variance*	*Sd*
1	6	9.59	1.598333	0.030097	0.173484
2	6	9.51	1.585	0.02827	0.168137
3	6	7.9	1.316667	0.090427	0.30071
4	6	7.81	1.301667	0.148177	0.384937
5	6	8.34	1.39	0.03196	0.178774
6	6	8.61	1.435	0.08407	0.289948
7	6	8.84	1.473333	0.118107	0.343667
8	6	8.79	1.465	0.05275	0.229674
9	6	8.28	1.38	0.0612	0.247386
10	6	10.55	1.758333	0.054897	0.2343
11	6	10.87	1.811667	0.059417	0.243755
12	6	14.79	2.465	0.28975	0.538284

Table – 189: P-Value

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	6.8254	11	0.620491	7.097273	1.5E-07	1.952212
Within Groups	5.2456	60	0.087427			
Total	12.071	71				

In the above ANOVA table p-value is less than alpha value (95% level of confidence) is 0.05 and f value is greater than f critical value which means that the null hypothesis will be rejected and alternative hypothesis will be accepted thereby indicating that there exists a significant difference in mean level of confidence in using digital devices after the training between the respondents of various professions.

The variation in mean level of confidence in using digital devices after the training among the the respondents from all professions across all the six zones is shown in the following table with the shaded region as indicated:

Table – 190: Range of Response Level: Purpose of using technology by various age groups

Professions	Range of Response Level				
	Highly Confident	**Confident**	**Not so confident**	**Unconfident**	**Highly Unconfident**
Over all Zone					
Student					
Farmer					
Trader					
Service sector employee					
Asha/Anganwadi workers					
Teacher					
Government servants					
Self-employment (VLES and small scale					

Professions	Range of Response Level				
	Highly Confident	**Confident**	**Not so confident**	**Unconfident**	**Highly Unconfident**
entrepreneurs)					
Others					
House wife's					
Private sector employee					
Wage labor's					

T-test paired samples

In the study, T- test paired samples have been performed for various zones to test the variation in the average level of confidence in using digital devices after training between male and female.

Following hypotheses have formulated for this purpose:

Null Hypothesis: there exists no significant difference in the average level of confidence in using digital devices after training between male and female

Alternative Hypothesis: there exists significant difference in the average level of confidence in using digital devices after training between male and female.

To perform this test, all the six zones have been shown in a single table:

Table – 191: Zone-wise Representation of Male and Female

Zone	Male (Im_{confi})(avg)	Female (Im_{confi})(avg)
North	1.626	1.654
South	1.6164	1.6152
East	1.6337	1.6336
West	1.628	1.6249
Central	1.65	1.651
North-East	1.6107	1.6107

Table 192: t-Test: Paired Two Sample for Means

t-Test: Paired Two Sample for Means

	Male	*Female*
Mean	1.627467	1.631567
Variance	0.000191	0.000327
Observations	6	6
Pearson Correlation	0.757798	
Hypothesized Mean Difference	0	
Df	5	
t Stat	-0.85171	
P(T<=t) one-tail	0.216633	
t Critical one-tail	2.015048	
Male Sd=0.013803	Female Sd=0.018071	

In the above table, t-value is less than t-critical value (-0.85171 < 2.0150) which explains that null hypothesis has to be accepted. Hence. It means that there is no significant difference in the average level of confidence in using digital devices after training between male and female.

V. Challenges Faced

This study also carried a few challenges that were faced by the team during the process of data collection and analysis:

Since many of the questions had been designed in a Likert scale format, difficulties had been faced in interpreting the responses received in the specified format.

During the data collection over phone, it was observed that the respondents need to rely on memory. In cases where the respondent had attended the training quite a long time back, such recall of information can introduce an error.

A duplicity/error in phone numbers was observed for the data of the respondents. As a result, in some cases it was not possible to reach out to the actual respondent instead the data was collected from alternate/supplemented source(s). This may be attributed to (1) lack of penetration of mobile to the rural masses, (2) social barrier in terms of sharing the phone number by the women respondent etc.

In few cases, data was collected from the concerned Village Level Entrepreneur (VLE) as it was difficult to get hold of the actual respondent. However, in some cases, the CIPS investigators experienced reluctance in terms of getting the data from the VLE.

Language barrier was a serious concern while collecting the data especially for the respondents belonging to Tamil Nadu, Kerala, Karnataka and parts of North-East. However, the investigators managed with the local language and collected the data.

As a major part of the respondents were student, it was very difficult to get hold of them during the office timings. To deal with this problem, the team of investigators went beyond their normal working hours and collected the data.

As an Aadhaar Card was made mandatory for a beneficiary to give the exam and get the certificate after the training, the analysis made in our study was limited only to the certified candidates. It was a challenge in the sense that our investigators were compelled to ask whether a candidate obtained certificate or not.

VI. A Way Forward

An online portal can be developed which is to be used by the VLEs for updating the information related to the training programme in regular intervals. This could also serve as a platform where the VLEs interact among themselves, share ideas and subsequently report to the concerned authority if there are any discrepancies. The officials could track the performance of a particular VLE on real time basis and suggest improvements during the course of programme. This would impart accountability and transparency into the system.

CIPS could act as a Mentor Agency to CSC e-Governance Services India Ltd in developing an online portal and subsequently validating the information shared by the VLEs.

As the VLE also manages the Common Service Centre which delivers basic public services in his/her locality, he could be made in-charge to ensure an Aadhaar Card for the beneficiary prior to the training. The process of obtaining the Aadhaar Card shall be initiated by the VLE by identifying the list of beneficiaries during the time of the commencement of the training programme. This also helps the penetration of Aadhaar system into the rural masses and enables them to have a unique identity for themselves in availing various services.

The respondents could be divided into several groups based on their readiness or desire to accept and absorb technology. The citizens can be placed on a scale ranging from the adept and the enthusiastic at one end to the sceptical, the hesitant and those who resist at the other.

An initial assessment or survey could be done to get the base data based on which govt. policies could be framed to handle each group in an effective manner. This could serve as a baseline survey, and can be of significant use to both the State and non-State actors. This data could be highly reliable in the sense that specific interventions addressing various groups could be designed and the policy decisions could become well informed. Also, as the govt. couldn't reach everyone, corporate sector could be made as a partner in this endeavor.

Since each state has its own peculiarity and needs to be handled accordingly, such targeted approach would make the training programme more efficient. Few of them are as follows:

For school students: a full-on approach, conscious effort to bring even those who resist technology into the fold. It would be worth it as the student has his life ahead of him.

For college students: Use those adept as part of training others, including those who resist;

Among the 30 plus age-group pick out those who are keen to learn, give them the honour of being the pioneers, train them and make then the trainers for the neighbourhood, friends and family.

For the 50 plus, leave out those who have no interest. For their day-to-day needs like banking, etc. let there be identified list of technology helpers whose services are available through the CSC.

CIPS would also propose to design a feedback module on the overall training (this could be a feedback form in line with the questionnaire prepared- Please refer the annexure). This feedback module could be made (mandatory) a part of the assessment that a candidate gives to obtain his certificate.

VII. Annexures

Annexure - 1: Questionnaire

A. Details of Trainee					
1	Name *		2	Gender *	○ Male ○ Female ○ Transgender
3	Age (in Years)*	○ 14 - 18 ○ 19 - 30 ○ 31 - 50 ○ 50 - 60	4	Mobile/ Telephone *	
5	Community *	○ General ○ OBC ○ SC ○ ST	6	Qualification *	○ Graduate ○ ITI/Diploma ○ Upto 12th ○ Upto 7th
7	Religion *	○ Hindu ○ Muslim ○ Sikh ○ Christian ○ Jain ○ Parsi ○ Budhism ○ Others	8	Candidate Type *	○ BPL ○ Not BPL
9	Profession *		10	Purpose of Attending the Training?	☐ To confidently use computers/ mobile phones / tablets / internet ☐ To get a new job/ promotion in the existing job ☐ To learn new skills

					online Others
11	Has the training been useful to you? *	Yes No	12	What was the duration of the training? *	Less than 7 7 - 10 10 - 20 20 - 30 30 or Above Ongoing Training
13	After how many days of training the exam was conducted? *	Less than 7 8 - 15 16 - 30 more than 30			

Address

14	Block *		15	District *	
16	State *				

B. Computer

17	Does your family own a computer? *	Yes No	18	Frequency of usage of computer *	Very Frequent Frequent Not so frequent Rare

C. Mobile

19	What type of device do you use? *	○ Mobile ○ Smart Phone/Tablet	20	Level of comfort in connecting WiFi in Smart Phone	○ Highly Comfortable ○ Comfortable ○ Not so comfortable ○ Uncomfortable ○ Highly Uncomfortable
21	Level of comfort in making video calls (Skype, Hangout etc.) *	○ Highly Comfortable ○ Comfortable ○ Not so comfortable ○ Uncomfortable ○ Highly Uncomfortable			
22	Awareness on using a mobile phone *	○ Well Known ○ Very Little Known ○ Not Known	23	Awareness on performing balance enquiry *	○ Well Known ○ Very Little Known ○ Not Known

D. Technology

24	Do you have an Email ID? *	○ Yes ○ No	25	Skills of reading/ writing an eMail	○ Very Good ○ Good ○ Neither Good nor Bad ○ Bad ○ Very Bad ○ Not at all

26	What are the Purposes of using Technology? * (Multiple Options can be selected)	☐ Agriculture Market Price Information ☐ Utility Bill Payment (Ticket Booking, Online Recharge)/Online Banking ☐ Getting information about educational/ employment opportunities ☐ Weather Information ☐ Accessing Govt. Websites/Filing online Applications (PAN Card, Passport etc) ☐ Others

27	Ease of accessing social networking sites *	○ Very Easy ○ Easy ○ Neither Easy nor Difficult ○ Difficult ○ Very Difficult	28	Reporting a grievance to the Local Government using mobile/computer *	○ Very Frequent ○ Frequent ○ Not so Frequent ○ Rare ○ Not at all

E. Training

29	Number of Trainees per batch *	○ 0 - 5 ○ 6 - 10 ○ 11 - 20 ○ 21 - 30 ○ 31 and above	30	Level of satisfaction with the computers/laptops available during the training *	○ Highly Satisfied ○ Satisfied ○ Neither Satisfied nor Dissatisfied ○ Dissatisfied ○ Highly Dissatisfied
31	Conduct of periodic assessments *	○ Regular ○ Neither Regular nor Irregular ○ Irregular	32	How did you find the assessment?	○ Very Easy ○ Easy ○ Neither Easy nor Difficult ○ Difficult ○ Very Difficult

33	Power supply to the class *	○ Good ○ Average ○ Poor	34	Availability of internet facility at the training center *	○ Good ○ Average ○ Poor
35	Responsiveness of the trainer to your queries *	○ Good ○ Average ○ Poor	36	Availability of Hands on training sessions with the mobile/laptop/computer *	○ Good ○ Average ○ Poor

F. Impact

37	Level of confidence in using digital devices after the training *	○ Highly Confident ○ Confident ○ Not so Confident ○ Unconfident ○ Highly Unconfident	38	Level of ease in using computer after training *	○ Highly Comfortable ○ Comfortable ○ Not so Comfortable ○ Uncomfortable ○ Highly Uncomfortable
39	Level of ease in using mobiles after training *	○ Highly Satisfied ○ Satisfied ○ Neither Satisfied nor Dissatisfied ○ Dissatisfied ○ Highly Dissatisfied			
40	Accessing website(s)/ portal(s) to search for Govt. Welfare Schemes/ Crop Prices/	○ Very Easy ○ Easy ○ Neither Easy nor Difficult ○ Difficult ○ Very Difficult	41	Educating Others (family, friends etc.) about the use of IT *	○ Very Frequently ○ Frequently ○ Not so frequently ○ Rare ○ Not at all

	Jobs etc., *				
42	Reccommending the training to your family members / friends *	○ Very Strongly ○ Strongly ○ Not so Strongly ○ Rare ○ Not at all	43	Difficulties faced during the training *	○ Very Much ○ A Few ○ Rare ○ Not at all

Annexure - 2: Assessment Study Team

Sl. No	Name	Designation	Role in the Study Team
1.	Dr. Nivedita P. Haran, IAS	Director, CIPS	Project Leader
2.	Mr, Avik Chakraborty	Project Officer, CIPS	Member
3.	Mr. Ashish Choragudi	Project Research Associate, CIPS	Member
4.	Mr. Mohammed Ahmed	Project Assistant, CIPS	Member
4.	Mr. T. Manish	Research Intern	Member
5.	Mr. K. Maharshi Mohan	Research Intern	Member
6.	Mr. P. Aksith	Research Intern	Member
7.	Mr. Praneeth Kumar	Research Intern	Member
8.	Ms. Ramya Sri	Research Intern	Member
9.	Ms. Ramya Harika	Research Intern	Member
10.	Ms. Ramya Keerthi	Research Intern	Member
11.	Ms. Deepa Das	Research Intern	Member
12.	Ms. Butul Parveen	Research Intern	Member
13.	Ms. B. Deepthi	Research Intern	Member
14.	Ms. P. Prasanna	Research Intern	Member
15.	Ms. N. Ravali	Research Intern	Member

Annexure - 3: Work Order

Digital India
Power To Empower

Date 24/11/2016

CSC
e-GOVERNANCE SERVICES INDIA LIMITED

CSC e-Governance Services India Limited
Electronics Niketan, 3rd Floor Delhi
6 CGO Complex, Lodhi Road
New Delhi - 110003 Tel: 011 24301349

Ref. No.: NDLM/IA/004

Subject: Placement of Work Order for Impact Assessment Study of the Digital Saksharta Abhiyan

Dear Dr. Nivedita Haran,

Refer to the proposal submitted by you via email, dated 24th November 2016, Ref. No. CIPS/Dir./CSC/16 and subsequent revisions thereafter, for Impact Assessment Study of the NDLM/DISHA.

1. We are pleased to inform you that based on the recommendations of the review committee; your proposal has been accepted. The Scope of Work is enclosed at Annexure-1. The cost of Impact Assessment is fixed at Rs. **18,42,500** (Service Tax extra as applicable).

2. You are requested to submit the final study report within three months of receiving this work order.

Yours sincerely

CSC e-GOVERNANCE SERVICES INDIA LIMITED

(Rishikesh Patankar)
HOO-Education

To

Dr. Nivedita P. Haran *I.A.S. (Retd.)*
College Park Campus of ASCI,
Road No.3, Banjara Hills,
Hyderabad-500034
Telangana

ANNEXURE-1: BROAD SCOPE OF WORK

1. **Study Objective**: The objective of this study is to assess the impact of DISHA training program and recommend improvements, suggestions and best practices.

2. **Methodology**: The proposed sample size is 50,000. The detailed methodology adopted may also be submitted in the report.

3. Data collection shall be the responsibility of Centre for Innovations in Public Systems (CIPS), Hyderabad

4. The data should be presented in descriptive statistics. Where ever applicable, advanced statistics (Tools like SPSS, SAS) should be used.

5. The study shall be conducted independently through CIPS team and must have a neutral stand point resulting in unbiased findings.

6. CSCSPV shall provide the data of candidates at the beginning of the study. At the end of each month, a descriptive report should be submitted to CSCSPV. After three months, a final comprehensive report should be provided. The report is expected to enlist various positive as well as negative factors, and provide pragmatic suggestions for future phases of this programme.

7. **Payment terms**

   a. 30% of the amount after submission of the questionnaire.
   b. 30% of the amount after submission of monthly reports of first two months.
   c. 40% of the amount after submission of the final report.

8. The payment will be released on the receipt of Invoice and approval from the CSC e-Governance Services India Limited.