



## A study on adaptability of online learning in Indian Micro, Small and Medium Enterprises

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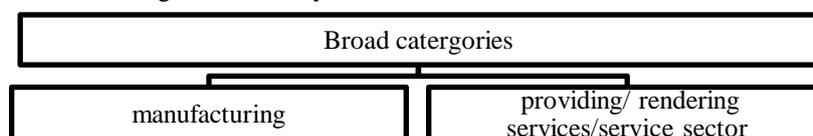
**Abstract:** Micro, Small and Medium Enterprise (MSMEs) play a vital role in Indian Economy with their contribution in industrial output, exports, employment, and production for Indian and international market. With the onset of the globalization process, the Indian Micro Small and Medium Enterprises (MSMEs) are lagging the rival firms. The rival firms originate from the neighbouring countries in terms of export competitiveness. The main reason attributed behind this is lack of use of updated technology and other notable reasons. This study examines the adaptability of online learning Indian MSMEs and Minitab software was used in the present study for analysis.

**Index Terms -** MSMEs, globalization, vital, Indian economy, adaptability, rival, online learning, e-learning.

### I. INTRODUCTION

In India and abroad, micro, small and medium-sized enterprises (MSMEs) have shown considerable strength and resilience in maintaining a consistent rate of growth and employment during the global recession and economic slowdown. Over the past few years, the Indian economy has shown strong growth success by contributing to creating livelihood opportunities for millions of people, improving the country's export potential, and increasing the country's overall economic development. Prompt and sufficient fiscal stimulus, efficient monetary policy and massive inflows of capital were instrumental in the economy's bouncing back situation [1]. Prompt and appropriate fiscal stimulus Effective monetary policy and huge inflows of capital have played a major role in the bouncing back of the economy as a catalyst for the country's socio-economic transformation. The MSME sector is extremely crucial in addressing the national goals of bridging the rural-urban divide, reducing poverty, and generating employment. Therefore, it is important for India to follow an effective policy framework that provides the required impetus to capture the opportunities and build an encouraging business climate to sustain the momentum of growth and holistic development [2]. It is equally critical that the MSME sector tackles infrastructural deficiencies and is well equipped to meet the emerging challenges in a globally competitive order for its sustainable growth and survival [3]. The last decade has witnessed a rapid globalization of economic activity and this phase of globalization has increased the value of cross-border cooperation in terms of innovation. The innovation process is carried out in terms of acquiring inputs from overseas for innovation (ideas, capital, expertise, technologies) and taking advantage of its outputs (products and services, patents, licenses, etc.) in overseas markets [4]. Many businesses, governments, and other global actors engage in today's international economy. Globalization is proving a boon in more effective resource distribution across countries, including increased production, output, real salaries, wages, increased competition, lower prices, increased variety, and quality of goods. Globalization creates a better competitive advantage for companies and reduces operational costs [5]. Finally, globalization has led to resource diversification, development of new investment opportunities by opening additional markets, and access to new raw materials and services. In 2006, the MSMED (Micro, small and medium enterprise development act) was passed by Parliament of India, on 16.06.2006. It provides the first ever legal framework for recognizing the concept of enterprise (the earlier concept was industry) comprising manufacturing and services, and integrating the three levels of these enterprises, i.e., micro, small and medium enterprises [3].

Under the Act, enterprises have been categorized broadly into two classification.



**Figure 01:** Showing Broad classification of enterprises under MSMED Act [6]

Further, the broad categories are classified in three major parts. They are Micro, Small and Medium enterprise, which is known as MSMEs in recent years. Over 90% of total enterprises in most of the economies are constitute by these enterprises and are credited with generating the highest rates of employment growth [7].

Enterprises	Manufacturing Enterprises (Investment limit in Plant & Machinery)	Service Enterprises (Investment limit in equipment)
Micro	Up to Rs.25 lakh	Up to Rs.10 lakh
Small	Above Rs.25 lakh- up to Rs.5 crore	Above Rs.10 lakhs up to Rs.2 crore
Medium	Above Rs.5 crore up to Rs.10 crore	Above Rs.2 crore- up to Rs.5 crore

**Table 1:** Shows basic definition of MSMEs [8] (Source: Small and Medium Business Development Chamber of India)

In 2018, the Micro, Small and Medium Enterprises Development (Amendment) Bill, 2018 proposes to reclassify all MSMEs, whether they are manufacturing or service-providing enterprises, based on their annual turnover.

Enterprises	According to 2006 Act		According to 2018 Bill
	Manufacturing Enterprises (Investment limit in Plant & Machinery)	Service Enterprises (Investment limit in equipment)	All enterprises (Annual turnover)
Micro	Up to Rs.25 lakh	Up to Rs.10 lakh	5 crores
Small	Above Rs.25 lakh- up to Rs.5 crore	Above Rs.10 lakhs up to Rs.2 crore	5 to 75 crores
Medium	Above Rs.5 crore up to Rs.10 crore	Above Rs.2 crore- up to Rs.5 crore	75 to 250 crores

**Table 2:** shows the redefined MSMEs according to MSME amendment bill 2018 [9]. (Source: Ministry: Micro, Small and Medium Enterprises, PRS Legislative research)

### 1.1 Importance of MSMEs for Indian Economy [10]

- **Employment:** After agriculture it is the second largest employment-generating sector. It provides jobs in India to approximately 120 million people.
- **Contribution to GDP:** MSMEs contribute about 6.11 per cent of manufacturing GDP and 24.63 per cent of GDP from service operations, with about 36.1 million units in the country's geographical expanse.
- **Exports:** It contributes about 45 per cent of India's overall exports.
- **Inclusive growth:** MSMEs foster inclusive development by providing job opportunities in rural areas to people who belong to poorer sections of society.
- **Financial inclusion:** In Tier-II and Tier-III cities, small enterprises and retail businesses build incentives for people to use banking services and products.
- **Promote innovation:** It gives young entrepreneurs the opportunity to create innovative products that improve market competitiveness and accelerate growth.

Thus, the Indian MSME sector is the pillar of the national economic system and serves as a bulwark for the Indian economy, offering resilience to fend off global economic shocks and adversities.

## II. LITERATURE REVIEW

As we are living in 21st century, it is very important to use the modern technologies in various aspects to initiate our work along with our organization. The development of the MSME sector is becomes essential as it is the backbone of India. However, despite high growth rates and good prospects, certain constraints have been imposed on the Indian MSMEs. The most notable barriers are lack of timely credit, procurement at competitive cost of raw materials, insufficient infrastructure facilities like electricity, water, and road, and lack of skilled manufacturing, services, marketing, etc [4]. Technological backwardness is the most important constraints faced until now. Various authors researched the cause of technology drawbacks in Indian MSMEs, and why government should take appropriate measures to introduce online leaning in Indian MSMEs is shown in table 3.

Authors	Study	Remarks	References
Sparkes, Adrian.et.al	The use of the Internet as a critical success factor for the marketing of Welsh agri-food SMEs in the twenty-first century	Suggested that small Agri-food companies should be able to access the Internet, build user-friendly websites and connect long-term to foreign markets.	[11]
Ayyagari et al.	Small and medium enterprises across the globe.	Financing represents a greater barrier to technology adaptation for small and medium-sized enterprises than it is for large businesses, especially in the developing world, and that access to finance adversely affects SME growth.	[12]
Barth, James R. et.al	Bank regulation and supervision: What works best?	The traditional wisdom that large banks are not attracted by small and medium-sized businesses and that this market is dominated by small banks and dependent on loans relating to them does not apply in practice.	[13]
Singh, Rajesh K. et.al	Strategy development by small scale industries in India	The rapid changes brought about in recent years by global trade and new marketing strategies have necessitated structural changes affecting micro, small and medium-sized enterprises worldwide. In addition to entrepreneurs adjusting to the changing climate, the developing countries have developed new policies to meet the requirements of many shifts in industry and trade.	[14]
Gemino, Andrew.et.al	Executive Decisions About Website Adoption in Micro, Small and Medium-Sized Enterprises	The findings provide guidance to practitioners working with MSMEs and policy makers interested in increasing the adoption of SME websites to some degree.	[15]
Savrul, Mesut.et.al	The potential of E-commerce for SMEs in a globalizing business environment	For Small and Micro Enterprises (SMEs) to compete on a global platform, e-commerce can help them overcome the multiple barriers and barriers that limit or prevent e-commerce entry.	[16]
Zabala-Iturriagoitia.et.al	Innovation management tools: implementing technology watch as a routine for adaptation	Managing innovation is sometimes seen as equivalent to managing technology or managing research and development. By concentrating on a range of small and medium-sized enterprises involved in a medium-sized high-tech field.	[17]
Davila, Antonio.et.al	Accounting and control, entrepreneurship, and innovation: Venturing into new research opportunities	Organized the reasons why enterprises need to employ specific technical techniques, such as helping to build new markets, extend the product range, etc.	[18]
Vonortas, Nicholas S. et.al	Process innovation in small firms: Case studies on CNC machine tools	Noted that the economic opportunities, internal resources and technical and organizational skills acquired or gained by a company over time, and the connection of a business with external sources of knowledge to learn about new technological innovations, were the key factors that influenced these companies in adopting process innovation	[19]
Danneels, Erwin.et.al	Product innovativeness from the firm's perspective: Its dimensions and their relationship with project selection and performance	Product innovation allows a company to have technical (enabling the company to manufacture the product) and customer-related (enabling the company to service other customers) competences.	[20]
O'Dwyer, Michele.et.al	Innovative marketing in SMEs	To have proper contact, the use of Internet media depends on management's preference, expertise, and personality.	[21]
Singh, Davinder.	Implementation of technology innovation in MSMEs in India: Case study in select firms from Northern region	Technological innovation has significantly increased, competition fuelled by the globalization of world economies and even small and medium-sized businesses are no longer safe against the threats posed by globalisation. It is a remarkable and, in some cases, a troubling situation because MSMEs play an important role in most economies, including India, as they are the largest business block and provide the bulk of employment.	[22]

Table 3: shows the various literature of Indian MSMEs studied by various authors.

The literature review shows that MSME's development has a significant role in the development of the country's economy. But MSME's are facing problems related to accessing the financial market, economic development, foreign trade, etc. due to poor technology adaptation as the enterprises are not aware of the technologies that are used in present scenario. However, due to limited human resources and weak financial standing, MSMEs, show lower adaptability of new technology and innovation.

Though, huge work is being published on various aspects of technology adaptation, various challenges faced by Indian MSMEs counterparts, but no work has been published on online learning adaptability in Indian Micro, Small and Medium Enterprises. Hence, the main purpose of this current work is to study the adaptability of online learning and how to implement various modern technologies in Indian MSMEs to increase the country's economic growth in various aspects.

### III. RESEARCH METHODOLOGY

The project intended to determine the adaptability of online learning in Indian MSME with various technologies to enhance the overall economic growth of the country. It also helps us in better understanding of the factors that are hindering the path in Indian MSMEs to adapt various technologies and how to overcome those barriers are also studied in this work. As per our research, the data was collected by means of questionnaire given to various organizations, companies and many more, to get different views regarding the work. The questionnaire measures the preferences of respondents using a five-point scale where 1 = Strongly disagree, 2 = Disagree, 3 =neutral, 4 = agree, and 5 = strongly agree.

### IV. ANALYSIS

We use both descriptive and inferential statistical techniques to analyze the data including reliability test, principle component analysis, and overall descriptive analysis by considering few variables using MINITAB statistical software. The survey measures the adaptability of online learning in Indian MSMEs of the options on a five-point interval scale.

#### 4.1 Reliability test/Item Analysis

This test is done to check the internal data consistency. Cronbach's alpha ( $\alpha$ ) is a measure of the internal consistency, that is, how closely connected a set of items is as a group. This is a valid indicator of size. It has been found that Cronbach's alpha is 0.8238, which indicates strong/better internal consistency among factors. This means that 82.38% of the variability in composite score is internally reliable variance. This test helps in further analysis by considering various tests.

Cronbach's alpha ( $\alpha$ )	Total No. of Respondents
0.8238	171

Table 4: Reliability Statistics (obtained using MINITAB Software)

#### 4.2 Descriptive analysis

We opted the random sampling for collecting the data. In total 171 responses were collected from various organization having different educational background from India. This analysis helps in better understanding the need of Online learning in Indian MSMEs based on various aspect as qualification of the people, age group and most importantly the experience in their respective organization. This will help in determining the causes why we are lagging the technologies. In this analysis, how the people think about MSMEs, the need of online learning in Indian MSMEs is necessary or not is analyzed based on people's education/qualification of the people, age group and most importantly the experience in their respective organization.

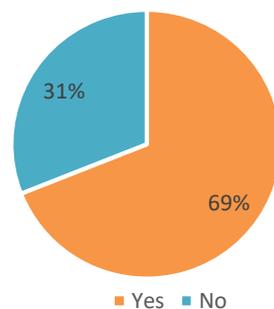


Figure 2: Shows what % of people are aware/not aware about MSMEs

From figure 2, it is seen that around 69% of people are aware of MSMEs which is a good sign in further adopting various technologies in Indian MSMEs.

Variable	What is your age group?	No. of respondents	Percentage	Mean	Standard Deviation
The need of adopting online leaning in Indian MSMEs is necessary?	below 20 years	23	11.69%	3.957	1.065
	21-25 Years	75	43.85%	4.187	0.968
	25-35 Years	35	20.46%	4.257	0.919
	36-45 Years	21	12.28%	4.333	0.796
	Above 45 Years	17	9.94%	4.471	0.717

Table 5: Opinion regarding the need of online learning in Indian MSMEs based on various age groups

From table 5, it was found that around out of 171 respondents, 43.85% from age group 21-25 years totally agree that it is necessary to implement online learning Indian MSMEs. It is because as this age groups are living in 21<sup>st</sup> century and they are more used to the modern technologies and hence they know the value and importance of adopting online learning. Out of all the age groups, the people above 45 years have the least percentage of 9.94% as they do not think that online learning is necessary in MSMEs. However, the people of age below 20 year has a bit higher value as compare to the above 45 years age group. Similarly, the same variable as taken in the table 5, is again analyzed based on the on the education/qualification of the people.

Variable	Education/Qualification	No. of respondents	Percentages	Mean	Standard Deviation
The need of adopting online learning in Indian MSMEs is Necessary?	10+2	41	23.97%	3.951	1.048
	Graduate	27	15.78%	4.318	0.897
	Ph.D.	66	38.59%	4.222	0.847
	P.G./PG Diploma	37	21.63%	4.324	0.884

Table 6: Opinion regarding the need of online learning in Indian MSMEs based on education/qualification

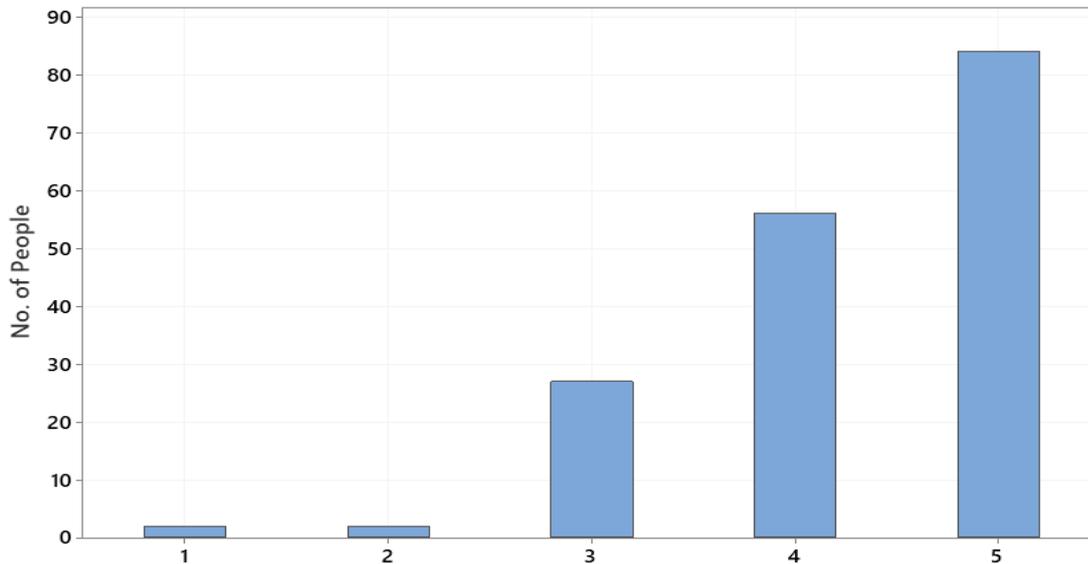
From table 6, it was found that around out of 171 respondents, 38.59% of the people having doctorate degree totally agree that it is necessary to implement online learning Indian MSMEs. It is because as they are highly qualified and educated and have various knowledge, regarding various aspects. They are also an important asset as they are more used to the modern technologies and hence, they know the value and importance of adopting online learning. Out of all the category of education, the people having graduate degree have the least percentage of 15.78% as they do not think that online learning is necessary in MSMEs. This is because they might be engaged with various work or having less knowledge. However, the people of 10+2 and Postgraduate have a percentage of 23.97% and 21.63% respectively. Similarly, the opinion regarding the need of online learning in Indian MSMEs is further analyzed in table 7.

Variable	How much experience do you have	No. of respondent	Percentage	Mean	Standard Deviation
The need of adopting online learning in Indian MSMEs is Necessary?	11-20 years	18	10.52%	4.278	0.752
	6 to 10 Years	26	15.20%	4.038	0.999
	Less than 5 Years	33	19.29%	4.182	0.95
	More than 20 Years	80	46.78%	4.385	0.768
	No Experience	14	8.18%	4.247	0.969

Table 7: Opinion regarding the need of online learning in Indian MSMEs based on education/qualification

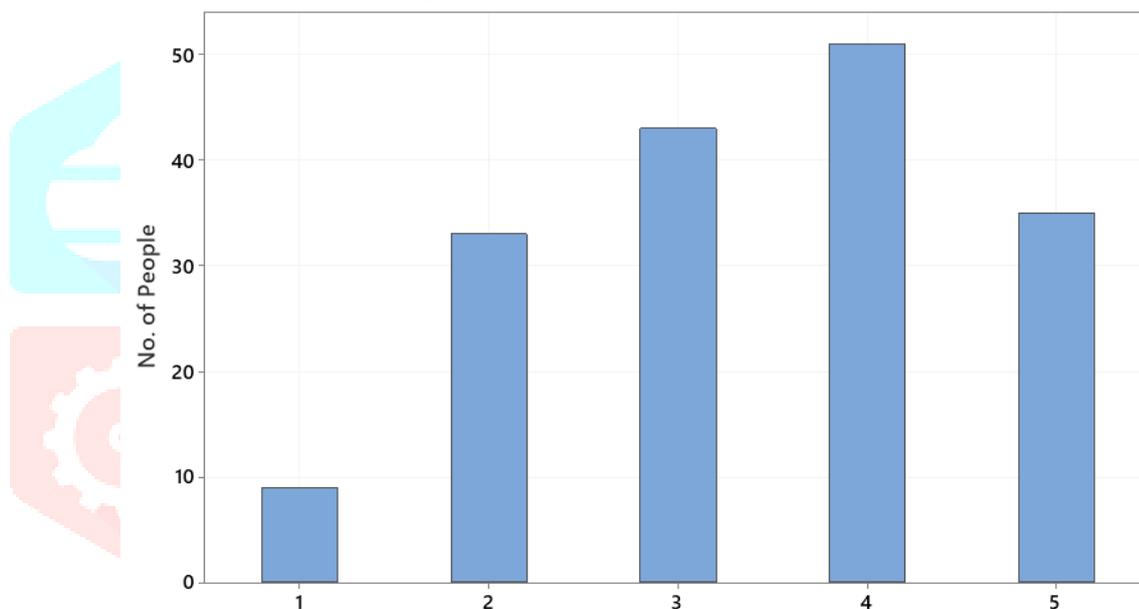
From table 7, it is valid that experience also plays an important in adopting online learning in Indian MSMEs. It was found that around out of 171 respondents, 46.78.% of the people having more than 20 years of experience fully agree that it is necessary to implement online learning Indian MSMEs. It is because as they are engaged with various organisation and knows the value of implementing online learning as it will bring a lot of change in Indian economy for adopting online learning in MSMEs. Out of all the category of experience, the people having no experience have the least percentage of 8.18% This is because of that the fact that they are not familiar with the need adopting modern technologies to promote online learning. However, other range of experience people also agrees with the decision of adapting online learning in Indian MSMEs.

It is very much clear that from the above data and analysis, the age groups, education, and respective experience plays an important role in making right decision in adapting online learning in Indian MSMEs. Figure 3 shows the overall opinion of people regarding the need of adapting online is Indian MSMEs is necessary.



**Figure 3:** the overall opinion of people regarding the need of adopting online learning in Indian MSMEs is necessary (1-Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

From above figure, around 49.12% i.e. 50% people strongly agree for the need of adopting online learning in Indian MSMEs.



**Figure 4:** Opinion regarding whether Indian MSMEs are lacking in adopting technology (1-Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

From figure 4, it can be seen that from column 4, most of the people think that Indian MSMEs are lacking in adopting technology which is not a good sign as we are living in 21<sup>st</sup> century and then also India is lacking in adopting technologies. Hence, proper education is required in order to make people understand the need of technologies, which helps in boosting up the Indian economy.

### 4.3 Principle component analysis (PCA)

Principle Component Analysis is a factor analysis technique in which multiple factors can be established in the form of latent variables (which are not directly measured but are instead inferred from other variables observed) that have not been determined prior to the analysis. Exploratory factor analysis is, in principle, the formation of factors or new latent variables which are random in nature and can then be interpreted according to formed factors, components or constructs. The analysis of the exploratory element is like the analysis of the key components (PCA). The researchers do not have the expertise, theory, or hypothesis in the exploratory factor analysis that composes the structure of factors to be developed or established, so that the exploratory factor analysis is a technique that helps to create a new theory. Methods like Principal Component Analysis are used to handle "curse of dimensionality" and avoid issues such as over-fitting in high dimensional space. PCA is a tool used to minimize the number of variables in your data by removing a wide pool of data from and small one [23].

Eigen analysis of the Correlation Matrix									
	V1	V2	V3	V4	V5	V6	V7	V8	V9
Eigenvalue	3.9012	1.2626	0.8037	0.7054	0.671	0.6006	0.4199	0.3851	0.2505
Proportion	0.433	0.14	0.089	0.078	0.075	0.067	0.047	0.043	0.028
Cumulative	0.433	0.574	0.663	0.741	0.816	0.883	0.929	0.972	1

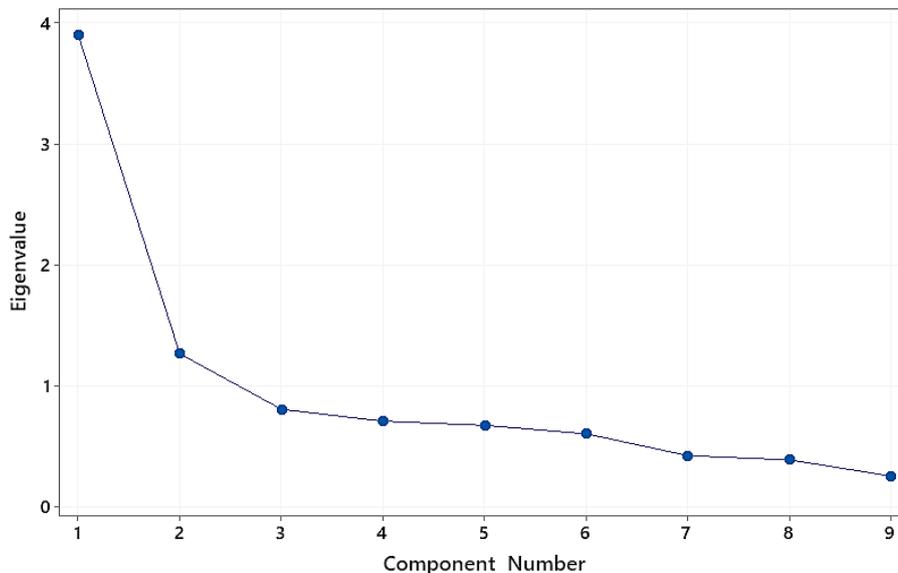
**Table 8:** Eigen analysis of correlation matrix

From table 8, V1 with a proportion of 0.433 that explains 43.3% % of the variability in the data. Therefore, this component is important to include. Another component i.e. V9 has a proportion of 0.028, and thus explains only 2.8% of the variability in the data. This component may not be important enough to include.

Variables	PC1	PC2	PC3	PC4	PC5
V1	0.365	-0.208	0.56	0.243	-0.112
V2	0.386	-0.166	0.362	-0.128	-0.255
V3	0.377	-0.294	-0.066	0.033	-0.107
V4	0.336	-0.331	-0.243	0.34	0.288
V5	0.376	0.017	-0.415	-0.158	0.161
V6	0.246	0.478	-0.271	0.202	-0.735
V7	0.257	0.518	0.034	0.532	0.438
V8	0.245	0.484	0.38	-0.485	0.252
V9	0.368	-0.036	-0.318	-0.473	0.078

**Table 9:** Eigen vectors of the principle components

In these results, first principal component has large positive associations with variable V1, V2, V3, V5 and V9. This component can adversely be used measurement of an opinion regarding adaptability of online learning Indian MSMEs. The second component has large negative associations with the opinion of different people. The third component has large negative associations V3, V4, V5, V6 and V9 so this component is also not that important in analysing the opinions of different people. Where, V1= Implement of Online learning is necessary, V2= The need of adopting online learning in Indian MSMEs is necessary, V3= Do you like the use of IT to promote products or services from your organization, V4= Each and every company should allow the customers to place orders online and to check the status of the order online, V5= If online learning is adopted, there must be communication between the instructor and the learner, V6= Indian MSMEs' struggle for technology adoption continues to restrict the growth in India for foreign trade, V7= Do you think Indian is lacking in adopting technology, V8= Do you think is there any overall impact of not adopting proper technology in Indian MSMEs, and V9= Does the government need to take initiative to familiarise the importance of modern technology in Indian MSMEs respectively.



**Figure 5:** Scree plot for variable V1 to V9

From the eigen analysis, the first three principal components have eigenvalues greater than 1. Hence, these three components explain 83.4% of the variation in the data. The scree also plots shows that the eigenvalues start to form a straight line after the third principal component. Therefore, it is very much clear that the remaining principal components account for a very small proportion of the variability (close to zero) and are probably unimportant.

## V. CONCLUSION

In Recent, MSMEs plays an important role in uplifting the Indian economy and GDP. Proper use of modern technologies to promote online leaning among various organization is very important. But due to inadequate adaptation of technologies leads to various issues like degrades the foreign trades and reduces the economic growth as well. Several points regarding the adaptation of online learning in Indian MSMEs and opinion given the people of various organization as mentioned below:

- A Survey analysis was conducted among 171 responses collected from various organization regarding the adaptation of online learning in Indian MSMEs.
- Various statistical test such as reliability test, descriptive analysis along Principle component analysis were done in order to check whether the data collected were consistence or not, variation in responses considering various factors such as age group, education/qualification and most importantly the experience of each person.
- Initially, reliability test/item analysis was performed to check the internal data consistency using Minitab software. It was found that Cronbach's alpha is 0.8238. This means that 82.38% of the variability in composite score is internally reliable variance. This test helps in further analysis by considering various tests.
- Descriptive analysis was conducted to study the how the responses from person to person. This test confirms that age group, education/qualification and most importantly the experience of each person matters the most in make making decision regarding whether there is any need of adapting online learning in Indian MSMEs or not.
- It was found that around out of 171 respondents, 43.85% from age group 21-25 years totally agree that it is necessary to implement online learning Indian MSMEs.
- About 38.59% of the people having doctorate degree totally agree that it is necessary to implement online learning Indian MSMEs. It is because as they are highly qualified and educated and have various knowledge, regarding various aspects.
- It is valid from descriptive analysis that experience also plays an important in adopting online learning in Indian MSMEs. It was found that around out of 171 respondents, 46.78.% of the people having more than 20 years of experience fully agree that it is necessary to implement online learning Indian MSMEs.
- Around 50% of the total respondent agree with the need of adapting online learning in Indian MSMEs.
- PCA was conducted to reduce number of variables in your data by extracting important one from a large pool of data.
- From eigen analysis, V1 with a proportion of 0.433 that explains 43.3% % of the variability in the data. Therefore, this component is important to include.
- In first principal component has large positive associations with variable V1, V2, V3, V5 and V9. This component can adversely be used measurement of an opinion regarding adaptability of online learning Indian MSMEs.
- A scree plot is plotted for all the variable and observed that Hence, these three components explain 83.4% of the variation in the data.
- It is to be concluded that Indian MSME's will have a great impact in coming future if online learning is adapted to promote various ideas among the various organization

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