International Journal of Advanced Research in Engineering and Technology (IJARET)
Volume 11, Issue 3, March 2020, pp. 152-161, Article ID: IJARET_11_03_014
Available online at http://www.iaeme.com/IJARET/issues.asp?JType=IJARET&VType=11&IType=3
Journal Impact Factor (2020): 10.9475 (Calculated by GISI) www.jifactor.com
ISSN Print: 0976-6480 and ISSN Online: 0976-6499

LEARNABILITY: AN INEVITABLE SKILL NEEDED FOR SUSTENANCE IN INDUSTRY 4.0

T. Mary Jones
Associate Professor, PACE Institute of Technology & Sciences,
Ongole, Andhra Pradesh, India

K. Prasanth Kiran
Associate Professor, SSN Engineering College,
Ongole, Andhra Pradesh, India

ABSTRACT

Today we are living in the era of fourth industrial revolution demanding variety of skills set for delivering various jobs. The world is transforming in a contingent way. This transformation is not only in terms of technology but a complete domino effect is being witnessed in the recent past. The technology, demography and the social changes are affecting the professional as well as personal life styles. The techniques and procedures followed in the organizations are becoming obsolete very quickly resulting in the need for new techniques. New jobs are created; even the most demanded jobs in the current days are not even present few years back. Thus the job description and the job specification is changing a lot these days. It is not the survival that is threatening the employee work force but it is about the sustenance of their jobs. Learnability is the skill that is coming to the aid of employees for sustenance. Learnability is the ability to quickly grow and adopt skill set to be employable throughout their working life. In this regard this study is aimed to identify the need of learnability skill among the people and how it affects their career.

A survey was conducted with a sample of 120 employees working in different sectors to identify the need to unlearn the present skill set and relearn the new skills for their job upgradation. The study revealed that unlearning and relearning is needed in every sector like educational institutions, software, manufacturing, fast moving consumer goods etc,. The time span for the change process varies from one sector to the other. The employees seeking new skills are being headhunted by the corporate world and are reaching the tip of their career ladder and the others are left behind.

Keywords: Learnability, Industry 4.0, Sustenance, Skills

Cite this Article: T. Mary Jones and K. Prasanth Kiran, Learnability: An Inevitable Skill Needed for Sustenance in Industry 4.0, *International Journal of Advanced Research in Engineering and Technology (IJARET)*, 11 (3), 2020, pp 152-161.
http://www.iaeme.com/IJARET/issues.asp?JType=IJARET&VType=11&IType=3

1. INTRODUCTION

The industrial sector is in fourth industrial revolution popularly known as Industry 4.0. Industry 4.0 is connecting the real and the virtual worlds resulting in production systems which are cyber physical production systems. Thus the manufacturing sector is experiencing a huge transformation in manufacturing.

Figure 1: Development stages of industrial manufacturing

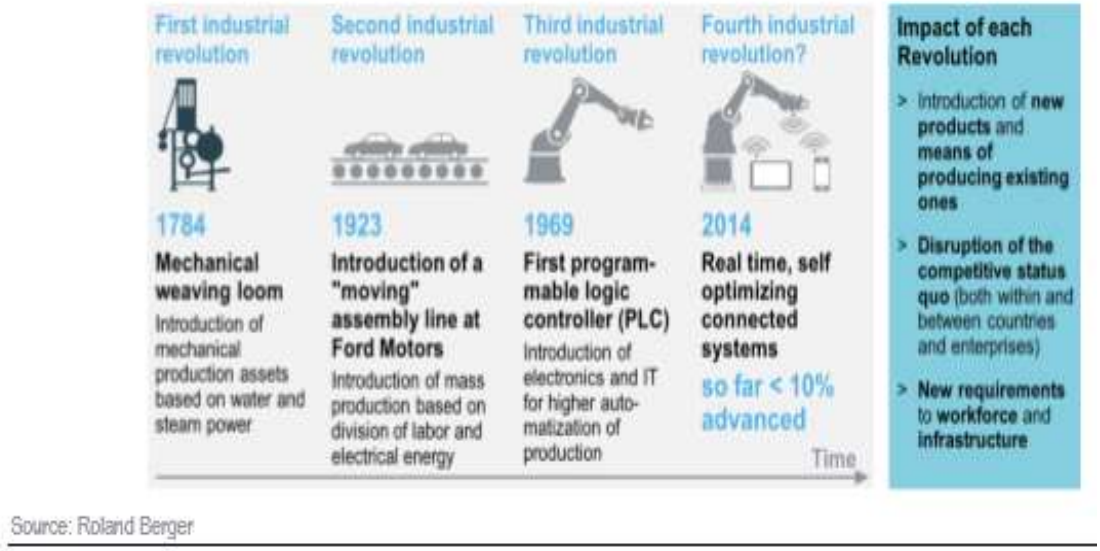

Figure 1

The transformation is coercing the employees to learn many things to suit to the changes made in the industry. Thus the attribute learnability has become the basic requisite in the present days to survive in the industry. An employee is expected to develop in 360 degrees to remain demanded in the professional environment. Fourth industrial revolution is expecting to change the social learning process and the way the tasks are being done in the organization. Basically Learning is an unavoidable and inseparable process with in the journey of any species on this earth and especially for the human beings it is the need of the hour. Because for all the species rest of the human beings this learning is only for survival but only for human beings it's not only survival but also sustenance in their field where they exist or work. One has to invite the change in to one's life, this is willingness to learn and the ability to adapt the changing scenarios in one's job or life.

Once market leader in the field of mobile phones and today it is no more, just because of the company missed out the learning and eventually it lost its business. The company didn't do anything wrong, but it could not update to the contemporary developments which made the company disappeared. This was the case of the great NOKIA at once.

Change – Growth – Improvement - Development

We want to grow, improve and finally develop ourselves.

What is development - normally speaking it is a betterment from yesterday to today and from today to tomorrow. This can't be taken place without the continuous learning or life long learning which means learn – unlearn & relearn, but we don't notice this change.

In the name of updating and upgrading of our skills we unlearn the old methods and switch to new and better methods in the name of relearning but we don't name it is a relearn.

Learning is defined as the relative permanent change in the knowledge of a person or behavior due to experience. The three features defined are:

- The change is long-term rather than short-term;
- The locus of the change is the content and structure of knowledge in memory or the behavior of the learner;
- The cause of the change is the learner's experience in the environment rather than fatigue, motivation, drugs, physical condition or physiologic intervention."

–From Learning in Encyclopedia of Educational Research, Richard E. Mayer

I am still learning – Michel Angelo

Michelangelo, who is renowned for sculpture, painting, poetry and architecture at the age of 87 is proclaiming about the need of learning. Thus we should all make learning as a continuous process in our life and be a life long learner.

The Lifelong learning is the continuous pursuit of knowledge in a voluntary and self-motivated manner. It improves the self-sustainability, employability and individual development among the people.

2. REVIEW OF LITERATURE:

Learning is the process of acquiring new or modified knowledge, behaviours, skills or preferences. The learning ability can be observed in humans, animals and sometimes machines also. The learning may be instant or repeated experiences teach humans and the learning is a continuous process. Learning process is a continuous one in the human beings and it lasts for life time. Learning is affected by various internal and external factors. The internal factors are like goals, interest, attention, fatigue, learning activities etc. The external factors are heredity, status of students, and physical environment.

(Boser, 2018) Many people believe that learning is a task for intelligent people but they forget that it is for everyone. That is why people don't focus on the right process of learning. People feel that learners are being born. But the recent researches indicate that the learners are being made and not only born. Boser identified three practical ways to build the learning skill. They are organize your goals, think about thinking and reflect on learning.

(Pérez, 2015) Perez conducted a study on comparing the adaptive learning to traditional learning. The adaptive learning involves the usage of tools and technology based artifacts to enhance the learning process among the students. The study compared the exercise scores of the students with the exercise scores of students with traditional learning and observed that the results are far better for the students with adaptive learning. The computer has been the long standing solution for the scalability and the cost of individual instructions.

(Jana Hackathorna, 2011) Jana conducted a study on four teaching techniques i.e lecture, demonstrations, discussions and in class activities. They observed that the four methods are suitable for different levels of learning and to various students. They vary in the depth of learning. But each method is useful for all teachers and students. The benefits from each method are varying depending on the activity of learning and the students.

3. RESEARCH GAP

The research in the area of learning was mainly focused on how the teaching methods should be implemented to train the students but not on the employees. New methodologies were introduced to teach students but not the people who are all in the industry already. Thus this study in conducted to prove that new methodologies are required to teach new methods to teach the employees and the graduates who are already in the market.

3.1. Objectives of the Study

The objectives of the present study are

- To examine the relationship between learning and sustenance.
- To identify the most important factors affecting the process of learning among individuals.

3.2. Hypothesis of the Study

H0: There is no statistically significant relationship between experiential learning and income levels.

H1: There is statistically significant relationship between experiential learning and income levels.

4. RESEARCH METHODOLOGY

The present study is a descriptive study which tries to establish the relationship between learning and sustenance in the industry.

4.1. Method of Data Collection

Primary Data

Data collected from the employees with MBA qualification using semi structured interview process with the support of structured questionnaire. Management education is very prominent and need to be transformed according to the changes in the organizations. And MBA graduates are needed in every industry and thus they were selected as a sample.

Secondary Data

Data is collected from various sources of print (newspapers, magazines, journals, research reports and books) and electronic media (websites, e-journals and databases).

Research Instrument: Structured questionnaire in google forms.

Sample Design

Sampling Universe and Sample Unit

The population for the study is all employees. Thus for the study employees working in various industries were selected.

Sampling Procedure:

The samples are drawn using non-probability method of sampling.

Sample Size:

The sample was selected on convenience basis. In total responses of 139, 120 responses were collected from individuals who are MBA qualified and working presently in variety of industries. A google form was used to collect data through e-mails.

5. DATA ANALYSIS

The first phase of the research is done through frequency analysis where all questions for both the analysts in the questionnaire are analyzed using SPSS. The analysis gave the bird's eye view of the overall analysis. The questionnaire being very technical and of greater depth lead to the need of being each question reviewed individually where frequency analysis was best suitable. It was done with the help of SPSS and Excel 2010.

5.1. Results and Discussion

The basic profile of the respondents is given in the Table No. 1:

Table 1 Basic Profile of Respondents

		Frequency	Percent
Gender	Male	99	82.5
	Female	21	17.5
	Total	120	100.0
Age	23 - 30 Years	63	52.5
	31 - 40 Years	38	31.7
	41 - 50 Years	19	15.8
	Total	120	100.0
Monthly Income	15000 - 20000	35	29.2
	20001 - 50000	44	36.7
	50001 - 100000	20	16.7
	100001 - 300000	21	17.5
	Total	120	100.0
Experience	1 - 5 Years	62	51.7
	5 - 10 Years	16	13.3
	10 - 15 Years	20	16.7
	15 - 20 Years	20	16.7
	Above 20 Years	2	1.7
	Total	120	100.0

The sample is widely distributed between the age group of 23 to 50 with monthly incomes ranging from Rs. 15000/- to Rs. 3,00,000/-. The study revealed that the employees with more experience are earning when compared to the employees with low experience. This can be justified by Pearson correlation test on the sample.

Table 2 Correlations

		Monthly Income	Experience
Monthly Income	Pearson Correlation	1	.563**
	Sig. (2-tailed)		.000
	N	120	120
Experience	Pearson Correlation	.563**	1
	Sig. (2-tailed)	.000	
	N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).			

Pearson Correlation test is used to establish the relationship between two variables. Thus the Correlation test between the monthly income of the respondents and their experience have resulted in a positive value of 0.563. the positive value indicates that these two variables are linearly correlated. But we can see that the value is only 0.563 which means there is also a lag in it. That is more experience gives more income but if the experience is not gained by employees in terms of knowledge but only number of years, then more earning is not possible by learning.

In this regard the study is continued to identify the factors to affect the learning process of employees. Eleven factors were selected to identify their impact on employees. Thus Cronbach's alpha test is conducted to measure the internal consistency of the factors.

Table 3 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized items	N of items
0.920	0.921	11

Cronbach's Alpha test gave the reliability of the measurement and the study is proceeded further to study the impact of these factors on learning. The variables covariance was estimated followed by Mann Whitney test to rank these factors.

5.2. Correlations

Table 4 Descriptive Statistics

	Mean	Std. Deviation	N
Technology	2.11	1.044	120
[Job Demands	1.79	.934	120
Job Migration	2.43	1.098	120
Trainer	2.36	1.091	120
Complexity	2.40	.874	120
Interest	1.71	.911	120
Family	2.31	1.091	120
Colleagues	2.40	1.118	120
Company support	2.12	.980	120
Career Growth	1.73	.968	120
Financial Benefit	2.06	1.071	120

Table 5 Correlations

		Technology	Job Demands	Job Migration	Trainer	Complexity	Interest	Family	Colleagues	Company support	Career Growth	Financial Benefit
Technology	Pearson Correlation	1	.558**	.450**	.482**	.579**	.414**	.376**	.459**	.489**	.520**	.378**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	129.592	64.708	61.367	65.342	62.800	46.792	50.992	63.800	59.483	62.467	50.242
	Covariance	1.089	.544	.516	.549	.528	.393	.429	.536	.500	.525	.422
	N	120	120	120	120	120	120	120	120	120	120	120
Job Demands	Pearson Correlation	.558**	1	.499**	.338**	.567**	.432**	.295**	.362**	.513**	.691**	.567**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.001	.000	.000	.000	.000
	Sum of Squares and Cross-products	64.708	103.792	60.833	40.958	55.000	43.708	35.708	45.000	55.917	74.333	67.458
	Covariance	.544	.872	.511	.344	.462	.367	.300	.378	.470	.625	.567
	N	120	120	120	120	120	120	120	120	120	120	120
Job Migration	Pearson Correlation	.450**	.499**	1	.571**	.562**	.531**	.442**	.583**	.741**	.521**	.578**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	61.367	60.833	143.467	81.367	64.200	63.167	62.967	85.200	94.933	65.867	80.967
	Covariance	.516	.511	1.206	.684	.539	.531	.529	.716	.798	.554	.680

	N	120	120	120	120	120	120	120	120	120	120	120
Trainer	Pearson Correlation	.482**	.338**	.571**	1	.589**	.461**	.676**	.777**	.660**	.370**	.277**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.002
	Sum of Squares and Cross-products	65.342	40.958	81.367	141.592	66.800	54.542	95.742	112.800	83.983	46.467	38.492
	Covariance	.549	.344	.684	1.190	.561	.458	.805	.948	.706	.390	.323
	N	120	120	120	120	120	120	120	120	120	120	120
Complexity	Pearson Correlation	.579**	.567**	.562**	.589**	1	.612**	.452**	.592**	.583**	.485**	.487**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	62.800	55.000	64.200	66.800	90.800	58.000	51.200	68.800	59.400	48.800	54.200
	Covariance	.528	.462	.539	.561	.763	.487	.430	.578	.499	.410	.455
	N	120	120	120	120	120	120	120	120	120	120	120
Interest	Pearson Correlation	.414**	.432**	.531**	.461**	.612**	1	.362**	.429**	.631**	.588**	.560**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	46.792	43.708	63.167	54.542	58.000	98.792	42.792	52.000	67.083	61.667	65.042
	Covariance	.393	.367	.531	.458	.487	.830	.360	.437	.564	.518	.547
	N	120	120	120	120	120	120	120	120	120	120	120
Family	Pearson Correlation	.376**	.295**	.442**	.676**	.452**	.362**	1	.690**	.477**	.278**	.272**
	Sig. (2-tailed)	.000	.001	.000	.000	.000	.000		.000	.000	.002	.003
	Sum of Squares and Cross-products	50.992	35.708	62.967	95.742	51.200	42.792	141.592	100.200	60.683	34.867	37.842
	Covariance	.429	.300	.529	.805	.430	.360	1.190	.842	.510	.293	.318
	N	120	120	120	120	120	120	120	120	120	120	120
Colleagues	Pearson Correlation	.459**	.362**	.583**	.777**	.592**	.429**	.690**	1	.662**	.402**	.457**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	Sum of Squares and Cross-products	63.800	45.000	85.200	112.800	68.800	52.000	100.200	148.800	86.400	51.800	65.200
	Covariance	.536	.378	.716	.948	.578	.437	.842	1.250	.726	.435	.548
	N	120	120	120	120	120	120	120	120	120	120	120
Company support	Pearson Correlation	.489**	.513**	.741**	.660**	.583**	.631**	.477**	.662**	1	.626**	.642**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	Sum of Squares and Cross-products	59.483	55.917	94.933	83.983	59.400	67.083	60.683	86.400	114.367	70.733	80.183
	Covariance	.500	.470	.798	.706	.499	.564	.510	.726	.961	.594	.674
	N	120	120	120	120	120	120	120	120	120	120	120
Career Growth	Pearson Correlation	.520**	.691**	.521**	.370**	.485**	.588**	.278**	.402**	.626**	1	.712**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.002	.000	.000		.000

	Sum of Squares and Cross-products	62.467	74.333	65.867	46.467	48.800	61.667	34.867	51.800	70.733	111.467	87.867
	Covariance	.525	.625	.554	.390	.410	.518	.293	.435	.594	.937	.738
	N	120	120	120	120	120	120	120	120	120	120	120
Financial Benefit	Pearson Correlation	.378**	.567**	.578**	.277**	.487**	.560**	.272**	.457**	.642**	.712**	1
	Sig. (2-tailed)	.000	.000	.000	.002	.000	.000	.003	.000	.000	.000	
	Sum of Squares and Cross-products	50.242	67.458	80.967	38.492	54.200	65.042	37.842	65.200	80.183	87.867	136.592
	Covariance	.422	.567	.680	.323	.455	.547	.318	.548	.674	.738	1.148
	N	120	120	120	120	120	120	120	120	120	120	120
**. Correlation is significant at the 0.01 level (2-tailed).												

5.3. Mann-Whitney Test

Table 6 Ranks

	Gender	N	Mean Rank	Sum of Ranks
Job Demands	Male	99	59.78	5918.00
	Female	21	63.90	1342.00
	Total	120		
Technology	Male	99	60.38	5977.50
	Female	21	61.07	1282.50
	Total	120		
Trainer	Male	99	58.86	5827.00
	Female	21	68.24	1433.00
	Total	120		
Complexity	Male	99	62.61	6198.00
	Female	21	50.57	1062.00
	Total	120		
Interest	Male	99	63.74	6310.50
	Female	21	45.21	949.50
	Total	120		
Family	Male	99	57.91	5733.00
	Female	21	72.71	1527.00
	Total	120		
Colleagues	Male	99	57.69	5711.00
	Female	21	73.76	1549.00
	Total	120		
Company support	Male	99	58.74	5815.50
	Female	21	68.79	1444.50
	Total	120		
Job Migration	Male	99	59.77	5917.00
	Female	21	63.95	1343.00
	Total	120		
Career Growth	Male	99	58.51	5792.50
	Female	21	69.88	1467.50
	Total	120		
Financial Benefit	Male	99	57.96	5738.00
	Female	21	72.48	1522.00
	Total	120		

Table 7 Test Statistics

	Job Demands	Technology	Trainer	Complexity	Interest	Family	Colleagues	Company support	Job Migration	Career Growth	Financial Benefit
Mann-Whitney U	968.000	1027.500	877.000	831.000	718.500	783.000	761.000	865.500	967.000	842.500	788.000
Wilcoxon W	5918.000	5977.500	5827.000	1062.000	949.500	5733.000	5711.000	5815.500	5917.000	5792.500	5738.000
Z	-.537	-.087	-1.181	-1.579	-2.437	-1.854	-2.010	-1.274	-.527	-1.495	-1.843
Asymp. Sig. (2-tailed)	.591	.930	.238	.114	.015	.064	.044	.203	.598	.135	.065
a. Grouping Variable: Gender											

Mann-Whitney test ranked the top three factors as Technology, Job migrations and Job demands. Technology is the driving force of the world since its prominence from 1990 to till date. That is the technology updation in every field needs the employees to learn it and implement it in their work environment to get benefitted from it.

Job migration is also affecting the learning in employees as they want to represent themselves suitable to the new job. An employee will be interested to migrate when he or she gets an increase in the salary or emoluments, or designation or most importantly self satisfaction.

Job demands is another important factor as the changing role of an employee is making the employee to learn many things.

6. OTHER FINDINGS FROM THE STUDY

- Males have responded that their interest towards learning is the most important factor affecting their learning. Females have opined that the family influences a lot on the learning process of individuals.
- In the process of learning the employees are expected to learn Technical skills followed by Managerial and Soft skills. Irrespective to the industry they are working in the employees are being asked for the technology to be sustainable in the market.

7. CONCLUSION

Thus it is very clear that the employees in various fields need to upgrade their skills regularly to sustain in the industry. Learning should be lifelong process and cannot be left behind at any stage in the life of an individual.

REFERENCES

[1] Boser, U. (2018). Learning is a Learned Behavior. Here's how to Get Better at it. *Harvard Business Review*.

[2] Jana Hackathorna, E. D. (2011). Learning by Doing: An Empirical Study of Active Teaching Techniques. *The Journal of Effective Teaching*, 40 - 54.

[3] Pérez, M. C. (2015). Informing and Performing: A Study Comparing Adaptive Learning to Traditional Learning. *Informing Science: the International Journal of an Emerging Transdiscipline*, 111 - 125.

[4] Ibrahim Waheed, Prof. Dr. Andy Seddon, (2018), Utilisation and Challenges of the Learning Management Systems in the Higher Education Institutions in Maldives: The Lecturers' and Students' Perspectives, *International Journal of Information Technology & Management Information System*, 10(1), pp. 01–10

[5] Prof. R. S. Pathani and Sapna Sah. (2015), A Qualitative Investigation into how Yoga Can Elevate Learning Capabilities in School-Going Children, *International Journal of Advanced Research in Management*, 6(3), pp. 152-156

[6] Dr. T. Venkata Rao, (2019), A Review on Awareness of Smart Learning Resources for the Improvement of Students in Mechanical Engineering, *International Journal of Mechanical Engineering and Technology*, 10(1), pp. 242–247.

[7] Mohammad M. Al Helih and Yacoub A. Nasereddin, (2019), A Roadmap for Improving E-Learning in Jordan and Ensuring the Quality of its Outputs, *International Journal of Management*, 10(3), pp.60-68,

[8] Dr. Partha Sarkarand Debangsu Sarma Chaudhuri, (2019), A Study for Developing a Measuring Instrument of "Organizational Learning", *Journal of Management*, 6(1), pp. 152-161.