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Comparative Study between Experienced and Inexperienced Employees in Technological Changes

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Abstract:*This comparative study attempts to find out the differences between experienced and inexperienced employees in the processes and attributions of a technological change management. So these two categories are compared based on technological change model adopted from previous studies in which employees' human capital influence their adoption and agility for diffusing technological changes. Accordingly, in this paper experienced and inexperienced employees' human capital, adoption, agility, diffusion and technological change management are compared to each other to realize that who have more capabilities to manage technological changes more satisfactorily. In order to reach this objective, the data collection is carried out among 255 experienced employees and 177 inexperienced employees of 200 IT companies in Pune-India. The respondents are asked for filling the questionnaire surrounding human capital, adoption, agility, diffusion and technological change management to measure their capabilities in each one for implementing technological change process satisfactorily. The collected data is analyzed through independent samples t test via SPSS. The results indicate that there is no significant difference between experienced and inexperienced employees but their human capital. Therefore, it is concluded that both experienced and inexperienced employees' capabilities are required during technological changes in organizations since their different human capital are complementarity to each other to become more adopted and agile in technology diffusion to implement technological changes satisfactorily.*

Keywords:*Human capital, adoption, agility, diffusion, technological change*

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I. Introduction

Change; an inevitable phenomenon, is being challenged in organizations during these recent mobilizing years. Organizations have to make changes in their products, employees, policies as well as their technologies to be the headmost in marketing competition. It can be said that the most discussing issue surrounding change is technology utilized in organizations to reach the final aim which is producing products according to customers' interests and market demands. Technologies being upgraded lead to updating of customers' preferences since customers are always searching for the newest. In these recent technological changes, the most significant and vulnerable figure is employees whose role is very critical in implementing technology since it is changing time after time. Employees have to be fit with these changing ceaselessly so they should be adopted and agile to diffuse technological changes occur in organizations. It is obvious that there are other conditions for getting these two qualities; employees need some abilities and skills related to new technologies to perceive and implement them. Now there is another issue whether experienced employees havingobsolescent human capital are more adopted and agile in technology diffusion or inexperienced employees getting updated skills recently through educationrelated to new technology seeming that old employees are experienced in old vintage whereas fresh employees are skillful in new vintage (Helpman and Rangel, 1998). Therefore, it is worth comparingtheir human capital for enhancing adoption and agility in diffusing technological changes to find out whether there is any difference between these two categories in adoption and agility of technological diffusion.

II. Literature Review

There are a large number of works considering employees' experience or skill as the main determinants in implementing new technology. As regard to vintage-specific human capital (Chari and Hopenhayn, 1991), there should be some differences between experienced and inexperienced employees as the former one recognized as old employees who are experienced in old vintage while the latter one recognized as fresh employees who areupdated skilled in new vintagenamed as technology-skill complementarity by Helpman and Rangel (1998). They believe that both experience and skill are required in technological change. Similarly,

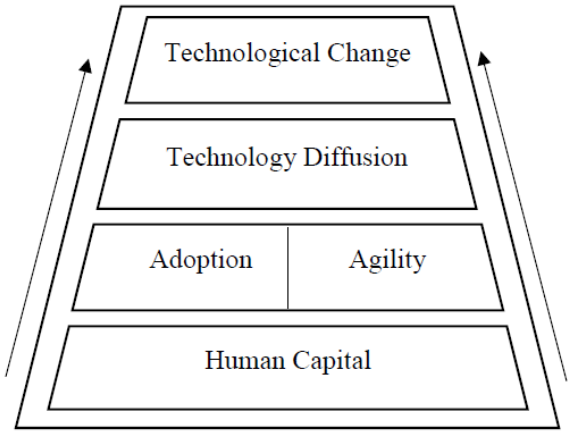
Chari and Hopenhayn (1987) argue that experience and skill as human capitals, have a complementarity relationship to each other. Kredler (2008) believe that experienced and skillful employees both are required in technological changes. So, the literature review would deal with both works related to either employees' experience or their skill in technological changes.On the one hand, there are researches consider achieved skills through educationas the main factor in implementing new technology adoptively and agilely (Bartel and Lichtenberg, 1987; ILO, 2010;) since it is believed that experience can be achieved during work life. On the other hand, there are a huge number of works inferring that employees' experience excels at technological changes rather than skill or knowledge achieved through education, training or via any degree (Fishbein and Ajzen, 1975; Perron, 2011; Thompson et al., 1994; Venkatesh and Davis, 1996).Accordingly, it seems that scholars have different opinion about the priorities of experienced employees who may have not updated skills related to new technology and inexperienced employeeswho are fresh educated ones possess upgraded skills related to new technology. Meanwhile some opine that both experienced and inexperienced employees are required in proceeding technological changes.

Based on the literature review, this study attempts to achieve the objective of this study that is to compare experienced and inexperienced employees in technological change process. Therefore, in this study Pawar and Meymandpour's model of technological change management (2017) is adopted to compare experienced and inexperienced employees during change process. In this model it is claimed that employees' human capital plays as a mediating variable to increase adoption and agility in diffusing technological changes. Broadly speaking, it is aimed that each construct of this model is compared between experienced and inexperienced employees to find whether there is any difference between these two categories during technological changes.

Objectives: The objectives of this study are shown in the following:
- To compare experienced and inexperienced employees' human capital in technological change process.
- To compare experienced and inexperienced employees' adoption in technological change process.
- To compare experienced and inexperienced employees' agility in technological change process.
- To compare experienced and inexperienced employees' diffusion in technological change process.
- To compare experienced and inexperienced employees' technological change management.

For achieving the objectives of this study; a model based on previous studies is developed to show the attributes compared between experienced and inexperienced employees in order to find out the differences between these two groups in a satisfactory change management process. The model for this study is depicted in Figure no 1:

Figure no 1: technological change model



So, experienced and inexperienced employees' human capital, adoption, agility, diffusion and technological change management would be compared in order to realize that who are more adopted and agile intechnology diffusion to achieve a satisfactory technological change process.

Questions: The questions of this study can be presented as the following:
- Is there any difference between experienced and inexperienced employees in their human capital?
- Is there any difference between experienced and inexperienced employees in their adoption?
- Is there any difference between experienced and inexperienced employees in their agility?
- Is there any difference between experienced and inexperienced employees in their technology diffusion?
- Is there any difference between experienced and inexperienced employees in their technological change management?

For reaching the aim of this study and answering these questions, the study is conducted through the following research design.

III. Research Methodology

In this comparative study, through accidental sampling method, 200 IT companies out of around 600 are selected as targeted area for conducting the data collection. The samples of this study are IT employees. The sample size is 255 experienced employees and 177 inexperienced ones out of approximately 2000 employees in Pune-India who are available and volunteer for filling the questionnaires. For calculating sample size, the sample size formula for finite populationless than 50,000 (Godden, 2004) is applied in this study:

$$\text{New Sample Size} = \frac{\text{Sample Size}}{(1 + (\underline{SS - 1}))}$$
$$\text{Population}$$

In order to collect data from the targeted sample, the respondents are asked for filling five questionnaires representing five constructs of this study with 6 point Likert scale.

Human capital questionnaire consists of12 statements which is based onSharabati et al.'s questionnaire(2010) with alpha of 0.75-0.95.

Adoption questionnaire consists of12 statements based on Taylor and Todd's questionnaire (1995) with alpha of 0.69-0.95.

Agility questionnaire consists of 12 statements based on Zhang's model of agility capabilities (2011) with alpha of 0.70.

Diffusion questionnaire consists of19 statements based on Sonnenwald, Maglaughlin and Whitton's questionnaire (2001) with alpha of 0.72-0.88.

Change management questionnaire consists of16 statements based on Cummings and Worley's model of activities contributing to effective change management (2008).

Reliability and validity: the consistency and accuracy of questionnaires are measured. The internal consistency reliability test shows that all questionnaires have alpha more than 0.79. Besides, exploratory factor analysis indicates that the KMO test has ideal standard points. Similarly, percentage of variances and factor loadings approximately show significant figures.

IV. Data Analysis

The collected data are analyzed through descriptive statistics for achieving frequency, percentage, mean and standard deviation as well as inferential statistics for testing the difference between experienced and inexperienced groups of respondents through independent sample t test with the application of SPSS.

Table no 1: Descriptive Statistics

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid experienced	255	59.0	59.0	59.0
inexperienced	177	41.0	41.0	100.0
Total	432	100.0	100.0	

Table no 2: Group Statistics

variables	Experience	N	Mean	Std. Deviation	Std. Error Mean
diffusion	experienced	255	43.7961	8.49766	.53214
	unexperienced	177	44.1243	7.66310	.57599
human capital	experienced	255	31.9176	9.07217	.56812
	unexperienced	177	30.0565	8.32215	.62553
adoption	experienced	255	27.1882	6.16281	.38593
	unexperienced	177	27.0282	5.99188	.45038
agility	experienced	255	27.7255	7.05512	.44181
	unexperienced	177	26.6158	6.24767	.46960
changemanagem ent	experienced	255	39.1725	12.05114	.75467
	unexperienced	177	37.1130	10.37089	.77952

Table no 3: Independent samples test for five constructs

variables		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
diffusion	Equal variances assumed	2.239	.135	-.411	430	.681	-.32822	.79894
	Equal variances not assumed			-.419	401.823	.676	-.32822	.78419
humancapital	Equal variances assumed	1.722	.190	2.168	430	.031	1.86115	.85828
	Equal variances not assumed			2.203	398.314	.028	1.86115	.84502
adoption	Equal variances assumed	.010	.922	.268	430	.789	.15999	.59614
	Equal variances not assumed			.270	385.383	.788	.15999	.59311
agility	Equal variances assumed	.472	.493	1.684	430	.093	1.10967	.65904
	Equal variances not assumed			1.721	405.384	.086	1.10967	.64477
changemanagement	Equal variances assumed	2.712	.100	1.848	430	.065	2.05955	1.11465
	Equal variances not assumed			1.898	410.596	.058	2.05955	1.08498

In Table no 3, it can be seen that the constructs do not show level of significance less than 0.05 except human capital which indicates high level of significance that means that there is no difference between experienced and inexperienced employees in technological change process but their human capital. The dimensions of human capital construct are separately tested as well to recognize the detailed differences between experienced and inexperienced employees. Table 4 and 5 show the descriptive statistics of each dimension and the t test for the dimensions of human capital:

Table no 4: Descriptive statistics for each dimension

Dimensions		N	Mean	Std. Deviation	Std. Error Mean
education	experienced	255	9.1808	3.04718	.22904
	inexperienced	177	10.3373	3.49972	.21916
innovation	experienced	255	11.2039	3.35052	.20982
	inexperienced	177	11.1582	3.32652	.25004
expertise	experienced	255	10.3765	3.42401	.21442
	inexperienced	177	9.7175	3.36583	.25299

Table no 5: Independent samples test for dimensions of human capital

Dimensions		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
education	Equal variances assumed	3.524	.061	3.558	430	.000	1.15646	.32500
	Equal variances not assumed			3.648	408.527	.000	1.15646	.31700
innovation	Equal variances assumed	.287	.593	.140	430	.889	.04573	.32683
	Equal variances not assumed			.140	380.428	.889	.04573	.32641
expertise	Equal variances assumed	.003	.960	1.981	430	.048	.65896	.33266
	Equal variances not assumed			1.987	382.799	.048	.65896	.33163

Table no 5 illustrates that there is a significant difference between experienced and inexperienced employees with P-value less than 0.05 in employees' education and expertise while there is no difference between experienced and inexperienced employees in their innovation as a human capital.

V. Findings

Regarding the data analysis, the achieved findings of this research paperare presented to reach to the objectives as well as answer the mentioned questions of this study so the findings can be declared as below:

- There is a significant difference between experienced and inexperienced employees in their human capital in technological changes.
- There is no difference between experienced and inexperienced employees in their adoption in technological changes.
- There is no difference between experienced and inexperienced employees in their agility in technological changes.
- There is no difference between experienced and inexperienced employees in their diffusion in technological changes.
- There is no difference between experienced and inexperienced employees in their technological change management.

Through the achieved findings, it can be interpreted that there is no difference between experienced and inexperienced employees in the processes of a technological change management but in their human capital that is quite clear there must be differences between experienced and inexperienced in their human capital since they are from different categories of education, training, experience, and so on. Accordingly with the results indicating there is no difference between experienced and inexperienced employees in technological changes but their human capital, it can be declared that experienced and inexperienced employees' human capital both are required in technological changes in organizations as they are complements to each other to managetechnological changes satisfactorily.

VI. Discussion

This comparative study aims to find out the differences between experienced and inexperienced employees in the processes of technological change management based on the model of technological change adopted from previous studies in which human capital plays as a mediating role for enhancing adoption and agility in diffusing technological changes. Thus, experienced and inexperienced employees' human capital, adoption, agility, diffusion and technological changes management are compared with each other to realize that according to their human capital which category is more adopted and agile in technology diffusion for implementing technological changes satisfactorily. Forasmuch as experienced employees have expertise and experience toward their current technology, they are not skillful to new coming technology. Besides they are recognized as old employees whose experience are obsolescent not related to new technology and required to be updated. Meanwhile inexperienced employees known as fresh employees whose knowledge is updated according to their recent degree and education so they are familiar with new technology although they are not experienced in implementing technology since they are new arrival to organizationowing to this fact, scholars opine different theories surrounding this essential issue. Hence, this study tries to determine the distinctions between these two groups through comparing their attributes required in a technological change management. So their human capital, adoption, agility, diffusion and technological change management are compared via applying independent samples t test. Practically, it is found that there is no difference between these two groups except their human capital that is quite obviously there must be differences in human capital of these two different categories which are differentiated from each other due to their different human capital.

Apart from the stated discussion, this research paper is confined to these achieved findings since the scope of this study is limited to compare two groups of employees; experienced and inexperienced ones in the processes of a technological change management. So the studied variables are presented to find out the differences between these categories based on technological change model in Figure 1 then other determinants and factors affecting technological change management are not included in this study. Moreover, the sample of this study is chosen from experienced and inexperienced employees so other categories or other hierarchy levels of staff in an organization are not studied here. Besides, the targeted area in this paper is IT industry so other technological industries are not involved in this research. Therefore, the achieved findings can be attributed to the same scope of this study.

Accordingly to these limitations, it is recommended that other determinants affecting technological changes can be investigated in future studies to distinguish experienced and inexperienced employees in technological changes more accurately. Furthermore, other levels of employees in an organization or even other categories can be involved in further studies to compare their functions and attributions during technological changes. Besides, other technological industries can be considered in future studies to compare their different levels of employees there to realize the employees' function in technological change management in different industries.

In conclusion, this study detects that there is no difference between experienced and inexperienced employees in the attributes required in proceeding technological change management but their human capital

such as education and expertise. It is found out that both experienced and inexperienced employees' human capitals are required for a satisfactory technological change management. Therefore, in spite of previous studies recognizing only one group with reference to their specific human capital for managing technological changes; this study believes that both experienced employees with their obsolescent human capital and inexperienced employees with their updated and educated skills are complements to each other. Lastly, it is noteworthy to mention that nowadays changes in technologies do not occur abruptly alike to previous decades. It can be opined that change is updation and upgradation of technologies which are welcomed by any levels of employees.

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