Experimentation in the Indian Knowledge Creating Companies

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Abstract

No organization can deny the importance of Experimentation in the process to innovate new products and services. The Experimentation in the organization allows companies to become knowledge creating companies. This empirical study focuses on the prevalence of Experimentation Ethos in the Indian Knowledge Creating Companies and how they vary across genders and sectors viz., Power, IT and Other Infrastructure sector companies as well as Public and Private sector Knowledge Creating Companies of India. An empirical data from 204 Knowledge workers from the six Knowledge Creating Companies have been collected through survey-questionnaire technique and further analyzed. The Private sector Knowledge Organizations have significantly higher Experimentation Ethos than Public sector Knowledge Organizations. The most important aspect and the takeaway of this analysis is that the Experimentation Ethos in the Knowledge Organizations belonging to the Infrastructure sector other than power sector crosses the middle of the norm and even little bit better than IT sector Knowledge Organizations. Both IT sector and Infrastructure sector Knowledge Organizations are significantly better than Power sector Knowledge Organizations in the realm of Experimentation Ethos. The female Knowledge Workers are significantly better than the male Knowledge Workers in the realm of Experimentation Ethos. Even though the usual limitations of survey-questionnaire technique apply, this empirical paper tries to contribute in this rarely researched area.

Keywords: Experimentation; OCTAPACE; Public sector; Private sector; Knowledge Creating Company.

INTRODUCTION

As per knowledge-based view of firms, Knowledge is a “primary” (Stewart, 1997) and “strategic resource” (Ipe, 2003) for providing “sustained competitive advantages” (Whitehill, 1997) to the Knowledge Organizations. For achieving

the sustainable and profitable future, the Knowledge Organizations focus more on Knowledge Management in general and Knowledge Creation in particular (Kumar, 2012). West and Iansiti (2003) argued that high performance organizations create new knowledge. Experimentation is one of the main methods of creating the new knowledge. Kang et al.,

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(2019) emphasized Experimentation and suggested its positive impact on growth of the firm because of generation of new knowledge and accumulation of core knowledge in the organization. West and Iansiti (2003) emphasized the importance of Experimentation and suggested that Experimentation is a good predictor of performance. Using Experimentation as one of the “key strategies and methods of Knowledge Accumulation, such as new ways of learning” (Kang et al., 2019), the Knowledge Creating Companies keep on excellent and sustainable performance. West and Iansiti (2003) emphasized Experimentation as “an essential phase of any industrial research program”, which not only speed up the problem-solving abilities of the firms but also new ways of solving problems and also argued that “Experimentation helps in improving the degree of confidence in the options generated by the organizations as well as increases the availability of number of options”. Gemmell (2017) demonstrated that “a preference for the Active Experimentation (AE) learning mode is rather strongly linked to entrepreneurial success”. No company can deny the importance of Experimentation in the process to innovate new products and services. The Experimentation in the organization allows companies to become Knowledge Creating Companies.

REVIEW OF LITERATURE

Kang et al., (2019) argued that “new knowledge is created by searching for novel combinations, which can be done through as Experimentation and Experimentation is defined as new ways of learning”. The Experimentation is one of the learning strategies and one of the main distinguishing features that differentiate between the competitive advantages of different organizations (Kang et al., 2019). West and Iansiti (2003) regarded Experimentation as “a tool to challenge past assumptions and re-examine approaches to problem solving” as well as “an inertia breaker”. Leonard-Barton (1992) emphasized that Experimentation is required for the sustainable success of the

organization. Dixon (1993) argued that there is not one panacea for all ills and suggested Experimentation with different methods as per the corresponding situations to survive and learn for the future success. McGill and Slocum (1993) argued for “unlearning old methods” and “continuous experimentation” for leaning in the firm and future success of the firms. Slocum, McGill and Lei (1994) emphasized “continuous experimentation” for Organizational learning and competitive advantages of the firms. Nevis, Ghoreishi and Gould (1995) developed a model for some of the dimensions of Knowledge Management, which includes “facilitating factors that focus on practices in the organizations especially experimental mind-set”. In dynamic environment, where everything is in the fluid state and changes very fast, problem solving is the main course of action for firms. West and Iansiti (2003) went one step ahead and argued about increasing the breadth and diversity of Experimentation in a dynamic environment. Rao and Abraham (1986) supported the idea of Experimentation as a strategy to look at the problems from newer perspective and solve it with newer ways. Nicholls-Nixon, Cooper & Woo (2000) defined strategic experimentation as “a series of trial and error changes pursued along various dimensions of strategy, over a relatively short period of time, in an effort to identify and establish a viable basis for competing”. On this basis, the Experimentation can be explained as trial and error approach towards solving problems. However, instead of considering Experimentation as the trial and error efforts by individuals, Frischmuth and Allen (1996) viewed Experimentation as an organizational process. Thomke (2001) argued for ‘enlightened Experimentation’ in the Organization as a new imperative for innovation, where cost of experimentation is high but new technology is making it easier to conduct experimentations.

Thomke (2013) emphasized the experimentation in the business to “unlock true capacity of innovation”. Gemmell (2017) argued that the “Active Experimentation learning mode” play a key role in

"Kolb's experiential learning cycle". Instead of focusing on the Experimentation as a process, it can be considered as a phenomenon such as learning mode that influences other processes and help employees to learn and produce new knowledge. Goh & Richards (1997) presented Experimentation quite uniquely as one of the dimensions of the Organizational learning survey and defined it as "the degree of freedom with which employees take risks and try and pursue new ways of problem solving and new ways of getting job done". The experiments, which require ample time and money, with the new scenario and situation are required in the organization for the learning to take place (Goh & Richards, 1997). Pedler, Boydell and Burgoyne (1989) suggested that to become a successful learning organization with competitive advantages, the organizational culture of that firm must encourage Experimentation within the firm. When creative individuals are provided with such kind of organizational culture that allows and promotes experimentations in the organizations, such employees use and improve creative skills to produce innovative products for the organizations (Choudhury, 2012). Where there are many creative and efficient employees in the organization, they feel good if management promotes experiments because they can utilize their innovative skills. These ideas about Experimentation definitely and firmly put the Experimentation as part of the Organizational culture. Pareek (1997) viewed Experimentation as one of the Ethos of Organizational Culture. Nonaka and Takeuchi (1995) argued that Knowledge is created at the individual level. However, the individual employee gets influenced by the culture and ethos of the organization e.g., Experimentation Ethos.

A variety of terms are being used in the context of organizational culture, which is a multi-level concept. Pareek (1997) argued about the core or first level of Organizational Culture is "Values, which give a distinct identity to a group". The Dictionary defined Ethos "as the fundamental character or spirit of a culture or dominant assumption of a people or

period". Pareek (1997) defined Ethos as "the underlying spirit of character of an entity or group and is made up of its beliefs, customs or practices" and proposed Eight Ethos called OCTAPACE. The OCTAPACE ethos are still being studied in great depth and found to be quite relevant for the study of Organizational Culture (Fatima, 2017). Panchamia & Pestonjee (2015) studied all the eight dimensions of OCTAPACE including Experimentation Ethos in the Power sector Organization in India. The Experimentation Ethos is one of the most important ethos for Creativity and Knowledge Creation. Pareek (1997) suggested that Experimentation Ethos, that allows and encourages innovative approach to problem-solving, encourages effective and efficient feedback and encourages creativity. Instead of using traditional, tried and tested ways to solve complex problems, the use of innovative approach is encouraged to solve it.

Although there has been several studies on the OCTAPACE collectively per se (Panchamia, 2013; Famina, 2009; Fatima, 2017; Mufeed & Gurkoo, 2007; Nika & Sofi, 2013; Siddiqui, Khan & Dhungana, 2013; Solkhe, 2013; Jain, Mehta & Bagai, 2014; Wani, 2013) and its impact and relationship with other organizational variables (such as Organizational Resilience (Fukofuka & Locke, 2015), Knowledge Capture in the Organizations (Kumar, 2016), Knowledge Creation (Kumar, 2013; 2014)), it's so rare to find the in-depth study focusing on the individual variables of OCTAPACE except Trust (Kumar, 2017b), its differentiating presence in various organizations, relative importance, relationship and impact on other individual and organizational variables. This empirical paper tries to cure some of that malaise by focusing on Experimentation Ethos, one of the variables of OCTAPACE.

Hypothesis:

Ho1: The Experimentation Ethos is not at all prevalent in the Indian Knowledge Creating Companies.

Ha1: The Experimentation Ethos is prevalent in

all the Indian Knowledge Creating Companies.

H02: The Experimentation Ethos in all the Knowledge Creating Companies belonging to different sectors are same, i.e., there is no sectoral difference in the Experimentation Ethos in the Indian Knowledge Creating Companies.

Ha2: There is a sectoral difference regarding Experimentation Ethos in the Indian Knowledge Creating Companies.

Ho3: There is no gender difference in the Experimentation Ethos in the Indian Knowledge Creating Companies.

Ha3: There is a gender difference in the Experimentation Ethos in the Indian Knowledge Creating Companies.

RESEARCH METHODS

Research Questions

What is the nature and prevalence of Experimentation Ethos in the Indian Knowledge Creating Companies and how do they vary across gender and sectors?

Objective

1. To figure out the status of Experimentation Ethos in the Indian Knowledge Organizations
2. To figure out the difference regarding Experimentation Ethos in Indian Knowledge Creating Companies belonging to different sectors.
3. To figure out the difference regarding Experimentation Ethos in case of different genders in Indian Knowledge Creating Companies.

Sample Design

The data from a random sample of 204 Knowledge Workers from the six Knowledge Creating Companies from India have been collected. The sample consists of Knowledge Workers from both Indian Public sector and Private sector Knowledge

Creating Companies, belonging to Power sector, IT sector and Infrastructure sector. To differentiate between Private sector and Public sector Knowledge Creating Companies, one dummy variable entitled "Sector" has been introduced in the data. There are pretty balanced 108 respondents from Public sector and 96 Private sector. Out of 204 respondents, there are 100 respondents from Power sector, 71 respondents from IT sector and 33 respondents from Infrastructure sector other than power sector. Two dummy variables have been introduced to identify and differentiate among Power, IT and Infrastructure sector Indian Knowledge Creating Companies. The diversity of the sample also includes both Male (171) and Female (33) Knowledge Workers. To differentiate between Male and Female Knowledge Workers, one dummy variable entitled "dummy gender" has been introduced in the data. Several studies on different Organizational variables such as Organizational leadership (Singh & Kumar, 2013) have been conducted on the same sample of respondents.

Measures and Data Collection:

The survey-questionnaire technique has been used to collect data from the above selected samples. Pareek (1997) developed a questionnaire on Organizational Cultural Ethos i.e., "OCTAPCE" having 40 questions, which relates to eight positive ethos of an Organization. One of the positive ethos is Experimentation. This questionnaire was used and the raw data on Experimentation was extracted and analyzed further ahead.

DATA ANALYSIS AND RESULTS

In the Table 1 (Descriptive Statistics-Experimentation Ethos), the mean of all 204 Experimentation is 13.14. The norms of Experimentation Ethos are Low at 11, Mid at 13.5 and High at 16. This is at the wrong side of the middle of the norms because a very high level of Experimentation Ethos is required for Knowledge Creation. The mean of the Experimentation Ethos in

the Private sector is 13.60 and it crosses the middle of the norms and is quite ahead of the mean of Experimentation Ethos of the Public sector Knowledge Organizations, which is at 12.72.

However, it would be tested further whether Private sector Knowledge Organizations have significantly higher Experimentation Ethos than Public sector Knowledge Organizations.

Table 1 : Descriptive Statistics- Experimentation Ethos

Particulars		All	Public sector	Private sector	Power sector	IT sector	Infrastructure sector except Power	Male KW	Female KW
N	Valid	204	108	96	100	71	33	171	33
	Missing	0	0	0	0	0	0	0	0
Mean		13.14	12.72	13.60	12.74	13.51	13.55	12.94	14.15
Std. Error of Mean		0.17	0.22	0.24	0.24	0.28	0.39	0.18	0.35
Median		13.00	13.00	13.00	13.00	13.00	13.00	13.00	14.00
Mode		13	12	13	12	13	11	13	13
Std. Deviation		2.38	2.32	2.36	2.38	2.38	2.22	2.40	2.00
Variance		5.65	5.40	5.57	5.65	5.68	4.94	5.75	4.01
Skewness		-0.036	-0.093	0.002	-0.108	-0.009	0.254	0.041	-0.172
Std. Error of Skewness		0.170	0.233	0.246	0.241	0.285	0.409	0.186	0.409
Kurtosis		0.552	0.573	0.631	0.523	1.273	-1.230	0.713	-0.110
Std. Error of Kurtosis		0.339	0.461	0.488	0.478	0.563	0.798	0.369	0.798
Range		15	13	13	13	13	6	15	8
Minimum		5	5	7	5	7	11	5	9
Maximum		20	18	20	18	20	17	20	17
a Multiple modes exist. The smallest value is shown									

Further, the sector-wise analysis of the Experimentation Ethos in the Knowledge Organizations belonging to Power sector, IT sector and Infrastructure sector other than power sector can also be done. In the Table 1 (Descriptive Statistics - Experimentation Ethos), the Experimentation Ethos in the IT sector is exactly on the middle of the norms at 13.51 and in the Power sector, it is on the lower end of the spectrum at 12.74. However, the most important aspect of this analysis is that the

Experimentation Ethos in the Knowledge Organizations belonging to the Infrastructure sector other than power sector crosses the middle of the norm at 13.55 and little bit better than IT sector Knowledge Organizations. However, whether the IT sector and Infrastructure sector Knowledge Organizations are significantly better than Power sector Knowledge Organizations would be tested ahead.

In case of gender difference in the Experimentation Ethos, the female Knowledge workers have positively crossed the norm of the middle of Experimentation Ethos at 14.15 and the male Knowledge Workers are on the other side of middle of the norm at 12.94 in the Table 1 (Descriptive Statistics- Experimentation Ethos). It would be interesting to know whether this gender difference in the Experimentation Ethos is significant or not.

Have Private sector Knowledge Organizations got significantly higher Experimentation Ethos than Public sector Knowledge Organizations?

This question has been answered using the dummy variable entitled "Sector" (which identifies Private sector Knowledge Organizations) in the regression equation as an independent variable and Experimentation as the dependent variable.

Table 2 : Coefficients^a of Sectoral Differences: Public Vs. Private Sector

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
Model		B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	12.722	0.225		56.487	0.000	12.278	13.166
	Sector	0.882	0.328	0.186	2.686	0.008	0.235	1.529
a Dependent Variable: Experimentation								

In the Table 2 (Coefficients^a of Sectoral Differences: Public Vs. Private Sector), the standardized and unstandardized beta as well as value of "t" is positive and significant even at 1% level of significance. This suggests that the Private sector Knowledge Organizations have significantly higher Experimentation Ethos than the Public sector Knowledge Organizations.

power sector Knowledge Organizations significantly better than Power sector Knowledge Organizations in Experimentation Ethos?

To find out the answer of the above question, two dummy variables viz., "dum var sec 1" for the IT sector and "dum var sec 2" for Infrastructure Sector have been introduced as independent variables and Experimentation being the dependent variable in the regression equation.

Are the IT sector and Infrastructure sector other than

Table 3 : Power Vs. IT Vs. Other Infrastructure Sector Knowledge Organizations Differences

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
Model		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12.740	.236		54.088	.000	12.276	13.204
	dum var sec 1	.767	.366	.154	2.098	.037	.046	1.488
	dum var sec 2	.805	.473	.125	1.703	.090	-.127	1.738
a Dependent Variable: Experimentation								

In the Table 3 (Power Vs. IT Vs. Other Infrastructure Sector Knowledge Organizations Differences), the standardized and unstandardized betas and t values of both the dummy variables for IT sector and Infrastructure sector are positive and significant at 5 % and 10% level of significance respectively. This suggests that both IT sector and Infrastructure sector Knowledge Organizations are significantly better than Power sector Knowledge Organizations in the realm of Experimentation Ethos.

Is there a significant gender difference in the Experimentation Ethos or not?

To solve this, a dummy variable for gender viz., “dum var gender” has been introduced as an independent variable and Experimentation Ethos as dependent variable in the regression equation.

Table 4 : Coefficients of Gender Differences

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
Model		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12.942	0.179		72.335	0.000	12.589	13.294
	dum var gender	1.210	0.445	0.188	2.720	0.007	0.333	2.087
a Dependent Variable: Experimentation								

In the Table 4 (Coefficients of Gender Differences), the values of unstandardized beta, standardized beta and “t” are positive and significant at 1% level of significance. This suggests that the female Knowledge Workers are significantly better than the male Knowledge Workers in the realm of Experimentation Ethos.

DISCUSSION AND CONCLUSIONS

The mean of the Experimentation Ethos in the Private sector crosses the middle of the norms and quite ahead of the mean of Experimentation Ethos of the Public sector Knowledge Creating Companies. The Experimentation Ethos in the IT sector is almost exactly on the middle of the norms and it is on the lower end of the spectrum in the Power sector, unlike Panchamia & Pestonjee (2015) research on Power sector organization, where it is at the higher end of the norms. However, the most important aspect of this analysis is that the Experimentation

Ethos in the Knowledge Creating Companies belonging to the Infrastructure sector other than power sectors crosses the middle of the norm and little bit better than IT sector Knowledge Creating Companies. Thus, the first null hypothesis “Ho1: The Experimentation Ethos is not at all prevalent in the Indian Knowledge Creating Companies” is rejected and accept the alternate hypothesis “Ha1: The Experimentation Ethos is prevalent in the all Indian Knowledge Creating Companies”.

It is interesting to note that IT sector Knowledge Organizations are always better than Infrastructure sector Knowledge Organization in the realm of several organizational variables viz., positive Ethos such as unitary OCTAPACE (Kumar, 2018c), Trust (Kumar, 2017b); Knowledge Technology (Kumar, 2018b); Knowledge Leadership (Kumar, 2017a) and Knowledge management dimensions such as Knowledge Creation (Kumar, 2018a), Knowledge Sharing (Kumar, a- In Publication); and Knowledge

types such as Tacit Knowledge (Kumar, b- In Publication) & Explicit Knowledge (Kumar, c- In Publication).

The Private sector Knowledge Creating Companies have significantly higher Experimentation Ethos than Public sector Knowledge Creating Companies, which is similar results as reported by Agrawal and Tyagi (2010). Unlike Agrawal and Tyagi (2010) research results that "Experimentation Ethos are equally valued by all sectors including IT/ITES sector", both IT sector and Infrastructure sector Knowledge Creating Companies are significantly better than Power sector Knowledge Organizations in the realm of Experimentation Ethos. Thus, the second null hypothesis "H02: The Experimentation Ethos in all the Knowledge Creating Companies belonging to different sectors are same, i.e., there is no sectoral difference in the Experimentation Ethos in the Indian Knowledge Creating Companies" is rejected and accept the alternate hypothesis "Ha2: There is a sectoral difference regarding Experimentation Ethos in the Indian Knowledge Creating Companies".

In case of gender differentiation regarding Experimentation Ethos, the Female Knowledge workers have positively crossed the norm of the middle of Experimentation Ethos and the Male Knowledge Workers are on the wrong side of middle of the norm. Unlike Agrawal and Tyagi (2010) research paper, the Female Knowledge Workers are significantly better than the male Knowledge Workers in the realm of Experimentation Ethos. Thus, the third null hypothesis "Ho3: There is no gender difference in the Experimentation Ethos in the Indian Knowledge Creating Companies" is rejected and accept the alternate hypothesis "Ha3: There is a gender difference in the Experimentation Ethos in the Indian Knowledge Creating Companies".

LIMITATIONS

This empirical paper focuses on Experimentation

Ethos, which is very important for the Knowledge Creating Company to keep growing, in the six selected Knowledge Creating Companies in India. High on the Experimentation Ethos truly provides direction and push towards knowledge creation on a sustainable basis for future profitability and success. The survey-questionnaire technique has been used to collect data from the 204 Knowledge Workers belonging to Knowledge Creating Companies working in different sectors of the Indian economy. The usual limitations of the survey-questionnaire technique apply. The ecological validity of the results and conclusion, thus derived, can only apply to other similarly placed Knowledge Creating Companies of India. The generalization of results beyond Indian Organizations or beyond Knowledge Creating Companies will not bring desired results. This empirical paper tries to fill the research gap both on Experimentation and Indian Knowledge Creating Companies.

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