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Revealing Mediating Role of Creative Self –Efficacy between Climate for Creativity and Creativity: Empirical Evidence from R&D of IT Sector, Pakistan

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Abstract

This study disclosed the mediating role of creative self-efficacy (CSE) between climate for creativity dimensions and creativity. The dyadic relationship between boss-subordinate is considered to assess the constructs in time lags. The study sample was drawn from 408 research and development (R&D) employees from information technology (IT) sector, Pakistan. The adopted and adapted questionnaires were utilized to collect the data. The data were analyzed through partial least squares, structural equation modeling technique through SMART PLS 3.2 software. The findings revealed significantly positive effects of major dimensions of climate for creativity on employees' creativity. Moreover, creative self-efficacy is proved as a mediator between various dimensions of climate for creativity and creativity except for organizational encouragement, challenging work and organizational impediments. Thus, practical and theoretical implications are provided for academicians and managers; particularly related to IT sector and generally related to other sectors in Pakistan

Keywords: Creativity, Climate for creativity, Creative Self-Efficacy

In present turbulent business environment, organizations are required to be more adaptive, creative, novel and entrepreneurial to convene the recent demands of the business arena. Creativity and innovation is one of the major features that can bring these attributes in organizations. Innovation is the successor of creativity and is the primary way to differentiate products from those of competitors. Employee's creativity is a valuable resource of an organization that requires employees to turn into creative individuals, because it has a profound impact on technology and innovation (Hu & Chen, 2019).Scholars of creativity research believe that creativity is a major constituent of all innovation either related to products or services (Runco, Paek & Jaeger, 2015; Woodman, Sawyer & Griffin, 1993).Creativity becomes a distinctive area of study in psychology and social sciences. Scholars have considered creativity as a desirable outcome of performance and remained curios about its antecedents (Girdauskienė, Asakalas & Savanevičienė, 2012).Therefore, it is appealing to reveal that how creativity can be explained and manifested in several disciplines (Kaufman & Glaveanu, 2019). Among predictors of creativity individual's own features or psychological states like personality traits, knowledge, intelligence, motivation, and self-efficacy are important (Chong & Ma, 2010; Jaiswal & Dhar, 2016; Stein, 1993). On the other hand, organizational aspects like leadership, skills and resources, organizational system, structure, supervisory support, organizational culture, climate of working and physical working conditions (Dul, Ceylan& Jaspers, 2011) also influence creativity of an individual. Thus, the interaction of individual and organizational climate seems to develop creativity as a desirable product (Perry-Smith & Mannucci, 2017). Such climates are studied as a whole (Djukic, Kovner, Brewer, Fatehi, & Cline, 2013) and evident to be multidimensionality in nature and include various interpretations by the individuals working in these environments (Hsu and Fan, 2010; Neal Griffin & Hart, 2000).

Consequently, scholars have shown deep interest in the development of measuring instruments and models of climate for creativity (Ekvall & Ryhammer, 1999; Isaken, Lauer &Ekvall, 1999; Ekvall & Tangeberg-Andersson, 1986). Amabile, Conti, Coon, Lazenby and Herron (1996) disclosed an ample model "KEYS: Assessing the Climate for Creativity" and identified stimulants and inhibitors of creativity in work environment (Tseng & Liu, 2011). KEYS contain a broad set of organizational aspects that either contribute or hinder creativity and render it as a comprehensive and convincing model of climate for creativity. Therefore, this study considered the KEYS: Assessing the climate for creativity as a main research foundation to assess perceptions of boss and subordinate regarding creativity. It is evident that perceptions of work environments act upon individuals through targeting internal psychological mechanisms of individuals, which leads to intrinsic motivation and empowerment (Zhu,Gardner & Chen, 2018) Such inner belief establishes self-efficacy, which is gradually becomes significant in management research. Tierney and Farmer

(2002) modified this concept of self-efficacy to creative self-efficacy (CSE). It is identified as a significant determinant of creativity and creative performance (Jaiswal & Dhar, 2016). Both CSE and creative behaviour has reciprocal relationship and CSE has a significant role in creativity (Wang, Tsai, & Tsai 2014).

Accordingly, this study is focused on psychological mechanism within an individual that leads to creativity through creative self-efficacy. This mechanism is investigated under the significance of climate of creativity in R & D of IT sector, Pakistan. Since outcomes of climate on creativity in different industries are different so research and development (R&D) in Information Technology (IT) industry of Pakistan and creativity determination by a valid model is yet to be explored. The creativity concept is mainly addressed in manufacturing industries (Nybakk, Crespell & Hansen, 2011), wherein its conceptualization in R&D of IT sector is rarely analyzed. (Isaksen & Akkermans,2011). Moreover, this study intends to introduce the mediating psychological mechanism of creative self-efficacy as a unique bridge between climate for creativity and individual's creativity in management research under the light of componential theory of creativity (Amabile, 1983).

Literature Review

Climate for Creativity and Creativity

Creativity involves the generation of novel and practical ideas (Sarooghi, Burkemper &Libaers, 2015). It is essentially an artefact of individual minds and work environment in which individuals carry out creative task (Amabile et al. 1996). Interactive influence of individual and the context is a prevalent perspective of creativity and creative behaviour after individual and contextual influence (Kim & Lee, 2011). Creative work can be done in a good social environment (Svedahl et al., 2015).Organizational work environment is found to be a major determinant of creativity (Amabile et al. 1996;Dul et al., 2011) and it is also termed as climate for creativity. Climate is referred as a recurring pattern of human behaviour that determines a life in the corporation (Isaken, Lauer, Ekvall, &Britz2001).Climates which are encouraging for creativity foster creativity (Hsu&Fan, 2010). These environments are multidimensional in nature and include various interpretations by the individuals working in it (Neal et al., 2000).Climate for creativity has also been identified as mediating mechanism between organizational aspects like leadership and innovation (Hassi, 2019). Coveney (2008) argued that perceptions regarding work environment leads to creativity and productivity. Considering the dominant importance of work environment, researches put forward several explanations of work climate or working environment. Examples are KEYS:Assessing the climate for creativity (Amabile et al., 1996) and affect climate (Parke &Seo, 2017). KEYS being well comprehensive model include various aspects of organizational climate for creativity. These include 1) *Encouragement of Creativity* (organizational encouragement, supervisory encouragement, and Work group support), 2) *Freedom/Autonomy* (independence given to perform according employee's own will), 3) *Sufficient Resources* (perceived availability of resources), 4) *Pressures* (workloads and time) and 5) *Organizational Impediments to Creativity* (hindrances towards creativity).

Based upon the above discussion it is evident that determinants of climate for creativity influence individual's creativity. Therefore, following hypotheses have been tested in this study, wherein practical and theoretical based results are expected:

H1: Organizational encouragement is positively related with creativity.
H2: Supervisory encouragementis positively related with creativity.
H3: Work group supportis positively related with creativity.
H4:Freedom is positively related with creativity.
H5: Sufficient resources arepositively related with creativity.
H6: Challenging work is positively related with creativity.
H7: Workload pressure is negatively related with creativity.
H8: Organizational impediments are negatively related with creativity.

Creative Self-Efficacy and Creativity

There are various antecedents of creative performance including individual attributes, contextual factors, thinking and psychosocial environment (Chong & Ma, 2010: Mathisen & Bronnick, 2009). One of these individual attribute is creative self- efficacy (CSE). Researches on creativity and motivation lead towards the concept of creative self-efficacy (Tierney &Farmer, 2002). It is a belief of self-capacity of knowledge, skills and abilities to carry out a job.It is internal feeling of motivation that determines an individual's particular behaviour (Bandura, 2007). It works

like intrinsic motivation and provide positive feeling to carry out a specific task in a specific way (Alotaibi, 2016). It is sort of confidence in one's self that is gained from within and from social context (Tierney & Farmer, 2011). Creativity and its associated divergent thinking are also linked with human characters such as self-efficacy (Voigt, Unterfrauner, Aslan & Hofer, 2019). Creative self-efficacy significantly determines creative performance (Jaiswal & Dhar, 2016; Tierney &Farmer, 2002).CSE and creative behaviour affects each other significantly (Lemons, 2010; Wang et al., 2014). Among other individual and contextual antecedents of creativity and creative performance, CSE is an important one (Chong & Ma, 2010; Mathisen & Bronnick, 2009). Therefore, following hypothesis is tested in this study:
H9: Creative Self-efficacy is positively related with Creativity.

Mediating Role of Creative Self efficacy between Climate for Creativity and Individual's Creativity

Creative self-efficacy of an employee itself is an output of several influencing factors. Slatten (2014) classified antecedents of CSE into three features, as related to job, leadership and self. Job tenure, supervisory behaviour and work complexity serves as major antecedents of CSE (Tierney & Farmer, 2002). Contextual antecedents also include autonomy, learning orientation, organizational affiliation (Mathisen & Bronnick, 2009), creative role identity and creative expectations by the boss also determines high levels of creative self-efficacy (Tierney & Farmer, 2010). Freedom and autonomy at work is valuable in enhancing one's CSE (Jaiswal & Dhar, 2016), because it makes an individual intellectually stable, flexible and confident to do what he likes. Similarly support from boss and organization also enables an employee to have capacity for tasks to do. Therefore job autonomy, freedom and support are important antecedents of CSE (Mathisen, 2011). A detailed model inclusive of many organizational antecedents is inevitable to predict Creative Self-efficacy (Chong & Ma, 2010).So it becomes interesting to figure out impact of climate for creativity on creative self efficacy as a psychological process within an individual towards being creative. High creative self-efficacy leads to creativity as a prerequisite (Diliello, Houghton, & Dawley, 2011) and CSE tends to increase one's creativity (Wang et al., 2014).Thus the following hypotheses have been drawn:

H10: Creative Self-efficacy mediates the relationship between organizational encouragement and creativity.
H11: Creative Self-efficacy mediates the relationship between supervisory encouragement and creativity.
H12: Creative Self-efficacy mediates the relationship between work group support and creativity.
H13: Creative Self-efficacy mediates the relationship between freedom and creativity.
H14: Creative Self-efficacy mediates the relationship between sufficient resources and creativity.
H15: Creative Self-efficacy mediates the relationship between challenging work and creativity.
H16: Creative Self-efficacy mediates the relationship between work load pressure and creativity.
H17: Creative Self-efficacy mediates the relationship between organizational impediments and creativity.

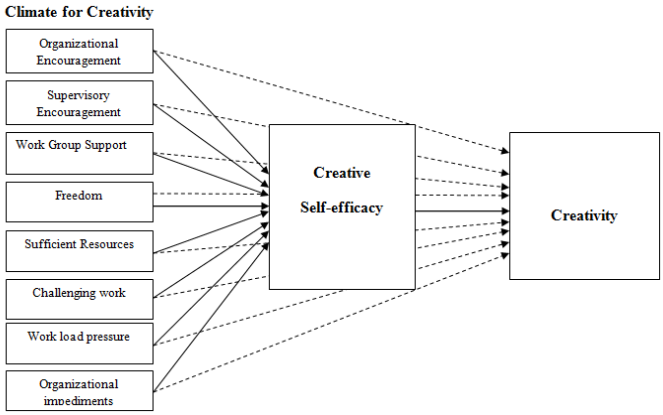

*Figure 1.*Research Model

Research design and methodology

Sample and data collection

This empirical study conducted on boss-subordinate dyads of R&D of IT companies geographically spread in Pakistan. Managers of the respective department were contacted and briefed about the study. A total of 640 survey questionnaire with boss-subordinate ratio of 1:4 were distributed. Out of these 408 surveys found complete in all aspects with a response rate of 64% finally included in the study. The resultant of data set included 102 bosses for their correspondent 408 subordinates and ensured the proposed ratio of boss-subordinate as 1:4. Dyads of Boss-Subordinate are used to measure responses without behavioural biases through time lagged study as recommended by Carmeli (2010).During time 1, the responses related to demographics, climate for creativity and creative self-efficacy questions were collected from employees. In time 2 after a gap of 1 month, the responses related to employees' creativity were retrieved from employers along with their demographics. To ensure the same respondent during time 1 and time 2, first three alphabets of respective name(s) of employees were used as codes for recognition. Among respondents by employees 84% were males and 16% were females. Ages of respondents were59 %as 21-30, 34% as 31-40 and 7% as 41-50 years. Job experience of 66% employees were 1-5, 20% were 6-10, 11% were 11-15 and 3% were16 year and above. Furthermore, 11% had M.phil & above degree, 26 % had Master's degree, 49 %had bachelor degree the rest of them 13% had intermediate education. There were total of 102 bosses for respective subordinates (employees). Among them 90.2% were males, while 9.8% were females. In terms of age, we can conclude that 1%respondents were 21-30 years old. 50% were between the age of 31 and 40. 43.1% respondents were between the age of 41 to 50 and 5.9%respondents were older than 50. The results also showed that most of the respondents had Bachelors degree (67%). 20.6% were Masters. M.Phil and Above were only 12.7% (13 respondents).Out of these 102 bosses 10%respondents had job experience of 1 to 5 years, while 23.5% had 6 to 10 years. The55.9%respondents had job experience between 11 to 15 years and 11% had experience of more than 16 years.

Survey instruments

All the variables were assessed on a five-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). All measures are perceptions of employees regarding work environment, creative self-efficacy and creativity. Overview of the survey instruments is as under:

Climate for Creativity (KEYS). Climate for creativity is measured with scale originally developed by (Amabile et al., 1996) naming KEYS: Assessing the Climate for Creativity scale. It is a well tested scale to measure perceptions about climate for creativity(Mathisen & Einarsen, 2004). 32 items of this scale have been used as revised by Verbeke ,Franses , Blanc and Ruiten (2008) in their study. All items were measured on a five-point likert scale ranging from *1= strongly Disagree* to 5=*strongly Agree.* Sample item was "New ideas are encouraged in this organization".

Creativity. Creativity was measured with employee's creativity scale introduced by (Zhou & George, 2001). It consisted of thirteen items. Sample item included *"*He/She suggests new ways to achieve goals or objective*".*

Creative Self-Efficacy. Creative Self-Efficacy was measured by using scale of 3 items developed by (Tierney & Farmer, 2002). This scale measured employees' faith in their capability to be creative and has been used in studies like Chong and Ma (2010). Sample item was "I have confidence in my ability to solve problems creatively."

Data Analysis and Results

Analysis was done using Smart PLS 3.2.0 software to explore the relationships amongst the variables. Smart PLS uses Partial least squares (PLS) method (Hair, Ringle&Sarstedt, 2011).It confirms model by investigating inner mode and outer model. The inner model refers to the investigation of latent constructs whereas outer model pertains to the constructs and their indicators. Hence factor analysis has been done to analyze scale's validity measures. Few researchers (Dimovski, 1994; Escring-Tena &Bou-Llusar, 2005; Skerlavaj&Domovski, 2009) recommended construct validity measurement by applying factor analysis technique. Path analysis has been done to investigate relationships between the constructs. The bootstrapping method (Hair, Hult, Ringle & Sarstedt,2014) has also been utilized to attain significance levels for path coefficients. Descriptive statistics are used to assess the study variables. All the constructs have above average means that lie between 3.493 and 4.249 and standard deviations (SD).

Table 1: Descriptive Statistics

Variables	Mean	SD	Min	Max
Organizational Encouragement	4.189	0.723	1.000	5.000
Supervisory Encouragement	4.152	0.710	1.000	5.000

Work Group Support	3.987	0.831	1.000	5.000
Freedom	3.642	0.876	1.000	5.000
Sufficient Resources	3.603	0.888	1.400	5.000
Challenging Work	3.493	0.817	1.400	5.000
Organizational Impediments	4.228	0.486	2.000	5.000
Work Load Pressure	4.249	0.569	1.000	4.800
Creative Self-Efficacy	3.998	0.717	1.000	5.000
Creativity	3.661	0.905	1.000	5.000

Testing the measurement model using PLS method

Average Variance Extracted (AVE) demonstrates the sufficient convergent validity of each dimension. The value of AVE >0.50 is accepted for sufficient convergent validity of the scale. Average Variance Extracted (AVE) acceptable range is higher than 0.5 as recommended by Fornell and Larcker (1981). Convergent validity is still adequate to measure any concept if AVE value is less than 0.50 but composite reliability (CR) is greater than 0.60 (Fornell & Larcker, 1981). In order to test construct validity an additional mark such as construct reliability is also used for dimensions confirmation. The value of CR 0.70 or greater is in the acceptable range of validity. Reliability values between 0.6 and 0.7 are also acceptable if other measures of validity are good.

Confirmatory Factor Analysis (CFA)

The given figure shows the results of CFA by using SmartPLS 3.2.0 software.

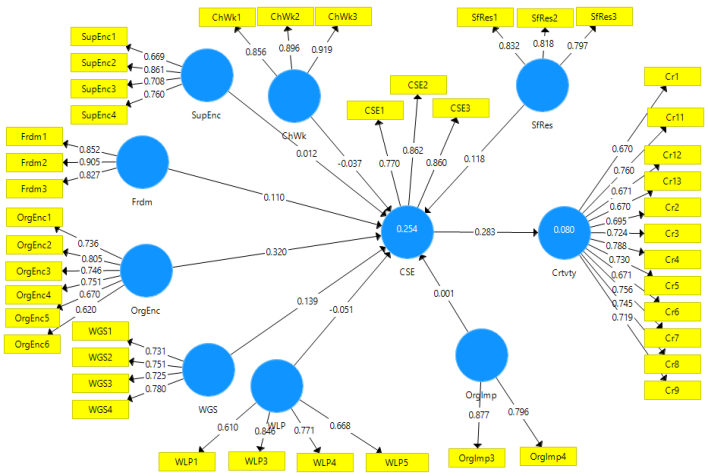

*Figure 2.*Confirmatory Factor Analyses

In the above figure the loading of each item is generated by using SmartPLS software. Generally the loading of each item should be >0.7, in this study, the criteria of >0.6 is usedas recommended by social sciences researchers (Awang, 2014; Chin, Gopal & Salisbury, 1997; Hair et al., 2014). The results found that there were few items with loading value less than recommended (0.60) due to which AVE of the latent variables was also not up to the standard range. These items were Cr 10, WLP 2, OrgImp 1 and OrgImp 2, and skipped in further analyses. The factor loading of each item and convergent validity is given in below table.

Table 2. *Factor Loadings and Convergent Validity*

Construct	Items	Loadings	α	CR	AVE
Organizational Encouragement	OrgEnc1	0.736			
	OrgEnc2	0.805			
	OrgEnc3	0.746			
	OrgEnc4	0.751			
	OrgEnc5	0.670			
	OrgEnc6	0.620	0.816	0.868	0.524

Supervisory Encouragement	SupEnc1	0.669			
	SupEnc2	0.861			
	SupEnc3	0.708			
	SupEnc4	0.760	0.792	0.838	0.567
Work Group Support	WGS1	0.731			
	WGS2	0.751			
	WGS3	0.725			
	WGS4	0.780	0.738	0.834	0.558
Sufficient Resources	SuffRes1	0.832			
	SuffRes2	0.818			
	SuffRes3	0.797	0.749	0.856	0.665
Challenging Work	ChWk1	0.856			
	ChWk2	0.896			
	ChWk3	0.919	0.875	0.920	0.794
Freedom	Frdm1	0.852			
	Frdm2	0.905			
	Frdm3	0.827	0.834	0.896	0.743
Organizational Impediments	OrgImp3	0.877			
	OrgImp4	0.796	0.578	0.824	0.701
Work Load Pressures	WLP1	0.610			
	WLP3	0.846			
	WLP4	0.771	0.704	0.817	0.532
	WLP5	0.668			
Creative Self-efficacy	CrSE1	0.770			
	CrSE2	0.862			
	CrSE3	0.860	0.777	0.871	0.692
Creativity	Cr1	0.670			
	Cr2	0.695			
	Cr3	0.724			
	Cr4	0.788			
	Cr5	0.730			
	Cr6	0.671			
	Cr7	0.756			
	Cr8	0.745			
	Cr9	0.719			
	Cr11	0.760			
	Cr12	0.671			
	Cr13	0.670	0.915	0.927	0.515

Alpha reliability and composite reliability was in range. AVE is also in acceptable range and ensures outer model fitness.

Table 3.*Discriminant Validity and Correlations*

Items	1	2	3	4	5	6	7	8	9	10
1.Organizational Encouragement	.724									
2.Supervisory Encouragement	.043	.753								
3.Work Group Support	.126	.219	.747							
4. Freedom	.055	-.073	.089	.862						
5. Sufficient Resources	.023	-.035	.158	.275	.816					
6. Challenging Work	.049	-.177	-.119	-.017	.254	.891				
7. Organizational Impediments	-.095	-.062	-.222	-.114	-.199	.108	.837			
8. Work Load Pressure	-.024	-.042	-.037	-.07	.250	.328	.186	.729		
9. Creative Self Efficacy	.022	.115	.244	.396	.310	-.152	-.149	-.052	.832	
10. Creativity	.148	.102	.238	.340	.519	-.060	-.295	-.078	.449	.718

Note: Diagonal values depict discriminant validity of the items

Discriminant validity is a measure used to ensurethatanyone of constructs is different from rest of the constructs. The value of discriminant validity should exceed the value of AVE of each dimension. Normally, if the value on the diagonal exceeds all the values in rows and columns of the matrix then discriminant validity is acceptable (Aljanabi, 2017). In table 3 values at the diagonal exceeds which determine that discriminant validity values acceptable.

The assessment of the structural "inner" model and hypotheses testing

Direct and indirect relationships among study constructs have been established by PLS algorithm technique and bootstrapping using smart PLS 3.2 computer software. Path coefficients and R square has been attained through PLS algorithm path analysis and t-statistics values and P values has been obtained through bootstrapping.

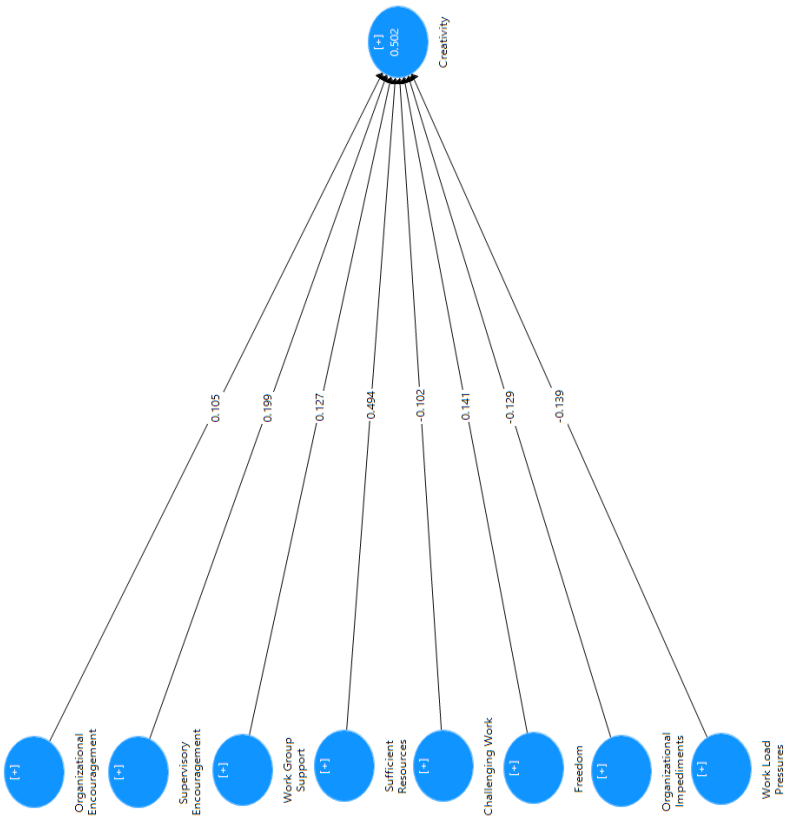

Figure 3. Direct Effects of climate dimensions on creativity

The above figure depicts the impact of independent variables on dependent variable. Challenging work, freedom, organizational encouragement, organizational impediments, sufficient resources, supervisory encouragement, work group support and work load pressure are independent variables however creativity is dependent variable. Challenging Work has negative and significant impact on creativity (Coefficient = -0.102, p = <0.05). Organization Impediments (Coefficient = -0.129, p = <0.05) and Work Load Pressure (Coefficient = -0.139, p = <0.05) have negative and significant impact on creativity. Freedom (Coefficient = 0.141, p = <0.05), Organizational Encouragement (Coefficient = 0.105, p = <0.05), Sufficient Resources (Coefficient = 0.494, p = <0.05), Supervisory Encouragement (Coefficient = 0.199, p = <0.05) and Work Group Support (Coefficient = 0.127, p = <0.05) have positive and significant impact on Creativity. R square value of each model is >0.26 which met the basic criteria of goodness of model fit.

Table 4: *Path Coefficients*

	Creativity
Challenging Work	-0.102 (p = <0.05)
Freedom	0.141 (p = <0.05)
Organizational Encouragement	0.105 (p = <0.05)
Organizational Impediments	-0.129 (p = <0.05)
Sufficient Resources	0.494 (p = <0.05)
Supervisory Encouragement	0.199 (p = <0.05)
Work Group Support	0.127 (p = <0.05)
Work Load Pressure	-.139 (p = <0.05)

	R Square	R Square Adjusted
Creativity	0.502	0.492

Mediation Analysis of creative self-efficacy

Figure 3 shows the results of mediation analysis. Challenging work, freedom, organizational encouragement, organizational impediments, sufficient resources, supervisory encouragement, work group support and work load pressure are independent variables, Creativity was dependent variables and however Creative Self-efficacy was mediating variable in the model.

The results shows that Organizational Encouragement has positive and insignificant impact on Creative Self-efficacy (Coefficient = 0.003, p = 0.955), Organizational Encouragement has significant and positive impact on Creativity in the presence of creative self-efficacy (Coefficient = 0.104, p = 0.008). Hence we can conclude that creative self-efficacy is not playing any mediating role between organizational encouragement and creativity. Figure 3 shows mediation effects of CSE between creativity and climate for creativity dimensions.

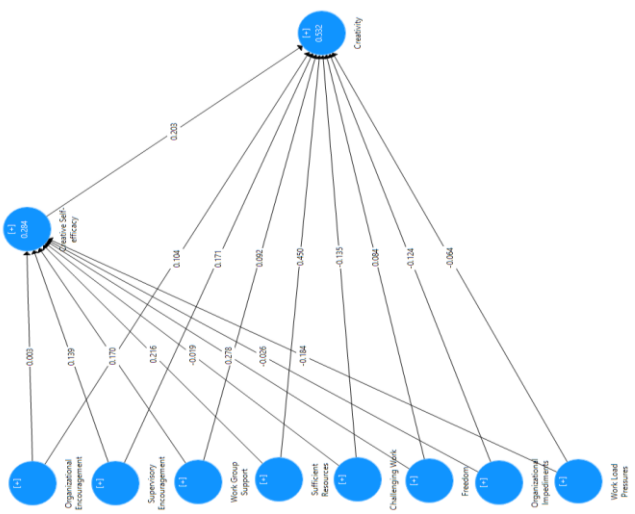

Figure 4. Mediation Analysis of creative self-efficacy

Supervisory Encouragement has positive and significant impact on Creative Self-efficacy (Coefficient = 0.139, p = 0.000), Supervisory Encouragement has significant and positive impact on Creativity in the presence of creative self-efficacy (Coefficient = 0.171, p = 0.000). The direct impact of supervisory encouragement on creativity is (coefficient = 0.199, p = 0.000). Partial mediation exists when the effect of mediator still remains significant by controlling independent variable. If

mediating variable is controlled and independent variable is no more significant, then full mediation exists. If both independent and mediator significantly predict dependent variable then findings must support partial mediation(Barron& Kenny, 1986; Hayes & Scharkow 2013; MacKinnon, Fairchild, & Fritz, 2007). Hence it can be concluded that creative self-efficacy is partially mediating the relationship between Supervisory Encouragement and creativity.

Work group support has positive and significant impact on creative self-efficacy (coefficient = 0.170, p = 0.000), work group support has significant impact on creativity in the presence of creative self-efficacy (Coefficient = 0.092, p = 0.039). The direct impact of work group support on creativity is (coefficient = 0.127, p = 0.000). Hence we can conclude that creative self-efficacy is partially mediating the relationship between work group support and creativity. Sufficient resources have positive and significant impact on creative self-efficacy (coefficient = 0.216, p = 0.000), sufficient resources have significant impact on creativity in the presence of creative self-efficacy (Coefficient = 0.450 p = 0.000). The direct impact of sufficient resources on creativity is (coefficient = 0.494, p = 0.000). Hence it can be concluded that creative self-efficacy is partially mediating the relationship between sufficient resources and creativity.

Challenging Work has negative and insignificant impact on creative self-efficacy (coefficient = -0.019, p = 0.607), Challenging Work has significant impact on creativity in the presence of creative self-efficacy (Coefficient = -0.135, p = 0.000). The direct impact of Challenging Work on creativity was significant (coefficient = -0.102, p = 0.000). Hence it can be concluded that creative self-efficacy is not mediating the relationship between Challenging Work and creativity.Freedom has positive and significant impact on creative self-efficacy (coefficient = 0.278, p = 0.000), freedom has significant impact on creativity in the presence of creative self-efficacy (Coefficient = 0.084, p = 0.009). The direct impact of freedom on creativity is (coefficient = 0.141, p = 0.000). Hence it can be concluded that creative self-efficacy is partially mediating the relationship between freedom and creativity.

Organizational impediment has negative and insignificant impact on creative self-efficacy (coefficient = -0.026, p = 0.682), organizational impediment has significant impact on creativity in the presence of creative self-efficacy (Coefficient = -0.124, p = 0.000). Hence it can be concluded that creative self-efficacy is not mediating between organizational impediment and creativity.Work load pressure has negative and significant impact on creative self-efficacy (coefficient = -0.184, p = 0.000), work load pressure has insignificant impact on creativity in the presence of creative self-efficacy (Coefficient = -0.064, p = 0.063). Hence it can be concluded that creative self-efficacy is fully mediating between work load pressure and creativity. The given tables show inner model measurements, the R square, path coefficients and total indirect effects of each relationship (Umar, Usman & Purba, 2018).

Table 5:*Path Coefficients*

	Beta	SD	T	P
Challenging Work -> Creative Self-efficacy_	-0.019	0.036	0.515	0.607
Challenging Work -> Creativity	-0.135	0.036	3.777	0.000
Creative Self-efficacy_ -> Creativity	0.203	0.040	5.063	0.000
Freedom -> Creative Self-efficacy_	0.278	0.059	4.674	0.000
Freedom -> Creativity	0.084	0.032	2.640	0.009
Organizational Encouragement -> Creative Self-efficacy_	0.003	0.051	0.056	0.955
Organizational Encouragement -> Creativity	0.104	0.039	2.681	0.008
Organizational Impediments -> Creative Self-efficacy_	-0.026	0.064	0.411	0.682
Organizational Impediments -> Creativity	-0.124	0.028	4.365	0.000
Sufficient Resources -> Creative Self-efficacy_	0.216	0.055	3.902	0.000
Sufficient Resources -> Creativity	0.450	0.042	10.725	0.000
Supervisory Encouragement_ -> Creative Self-efficacy_	0.139	0.035	3.934	0.000

Supervisory Encouragement_ -> Creativity	0.171	0.049	3.495	0.001
Work Group Support -> Creative Self-efficacy_	0.170	0.048	3.564	0.000
Work Group Support -> Creativity	0.092	0.044	2.071	0.039
Work Load Pressures -> Creative Self-efficacy_	-0.184	0.036	5.053	0.000
Work Load Pressures -> Creativity	-0.064	0.035	1.863	0.063

Table 6: *Total Indirect Effects*

	Beta	SD	T	P
Challenging Work -> Creativity	-0.004	0.008	0.501	0.617
Freedom -> Creativity	0.056	0.016	3.556	0.000
Organizational Encouragement -> Creativity	0.001	0.011	0.055	0.957
Organizational Impediments -> Creativity	-0.005	0.014	0.390	0.697
Sufficient Resources -> Creativity	0.044	0.015	2.970	0.003
Supervisory Encouragement_ -> Creativity	0.028	0.009	3.021	0.003
Work Group Support -> Creativity	0.035	0.012	2.780	0.006
Work Load Pressures -> Creativity	-0.037	0.010	3.805	0.000

Results and Discussion

The result depicts that initial hypothesis are accepted. As H1 revealed that organizational encouragement leads to employee's creativity. The employees feel energised to bring out creative outputs. Organizational encouragement inspires employees to admit risk and failure during process of creation. On the other hand supervisor's support provides explicit goals and allows oneself to contribute individually to the main outcome through motivation. Similarly, peers of the group also exercise trust and criticism among selves. They carry together initiatives and assist each other to make the idea brilliant and more creative (Verbeke et al., 2008). These dynamics renderedH2; supervisory encouragement is positively related with creativity and H3;Work group support is positively related with creativity,accepted through this study. These results are supported under the outcomes of Band's (2014) study of climate and organizational creativity interrelationship.

The freedom to accomplish tasks in individual's own way gives him/her confidence and ownership to perform his/her own way (Amabile et al, 1996). Hence the internal drive to perform something creative is initiated and extends creativity. Since autonomy, gives poise to conduct a task in person's own way, thus free hand to carry out creative work assures high levels of creativity. Same results have been realized in study of Band (2014) for freedom and creativity. Hence H4; Freedom is positively related with creativity proved true.

Sufficiency of organizational resources affects almost all areas of it. Resources equip an individual with necessary material inputs to work in a comforted manner. The perception of sufficiency of the resources should be instrumental in enhancing individual creativity but the results have shown other way. H5; Sufficient resources are positively related with creativityisrejected under this study. This may because perceived availability and allocation of resourcespsychologically drives individuals towards belief of task significance for organization (Amabile et al, 1996). Conversely, conservation of resource theory (Hobfall, 1989) explains that people urge to conserve resources and avoid resource loss stronger than their gains. Thus in this context, despite plenty of resources people may remain ineffective for creativity and don't remain concerned for sufficiency of resources.

Like sufficient resources, relationship of challenging work and creativity has also been proved insignificant. Expectancy theory (Vroom, 1964) explains such phenomenon where there is effort and reward association. People perceive the outcome of their efforts sufficient to fulfil their needs. So challenging work doesn't seem fruitful in this scenario because people don't work for challenges rather for benefits they shall receive in doing so. This phenomenon can also be addressed under the light of self-determination theory (Deci & Ryan, 1985), which advocates the internal drive of the individual towards self-motivation. Therefore external forces like challenging work itself would become least important towards internally derived output like creativity. So H 6;Challenging work is positively related with creativityis also rejected in this study.

Work load pressures have been tested as one of main impeding factors of creativity if exceeds than the desired level. Performance of individuals increases with increase in work load pressure but till some extent (Andrews & Fariss, 1972). Undesired pressures or overload creates discomfort in the individual thoughts (Amabile et al., 1996). They irritate the focus of the individual on a particular creative task and hinder attention to detail. Research on pressure and creativity provided us with two outputs in terms of pressures. Sometimes these are unrealistic workloads and on the other side these are said to be a challenge. If these are like challenges and of the demand of the project then they raise creativity and otherwise decrease creativity. However as a general case in our data set the R&D employees are under high pressure of time and control. Therefore H7; Work load pressure is negatively related with creativity is accepted in this study.

Other organizational attributes such as rigidity, power positions, politics, dissensions, formality in structure (Cook, 1998) and adherence to old traditions hamper creativity. This is because individuals seek openness and freedom to conduct task in their own way and these mentioned aspects are perceived as controlling. These affect intrinsic motivations of the individuals (Deci & Ryan, 1985) such that these undermine individual's willingness. Contrary to expectation, the employees of R & D in IT sector won't take part in organizational impediments and engaged in routine tasks. They focus on exploration and research activities without considering any impediments to their work activities. Thus, organizational impediments have proved to be insignificant with creativity. Hence our hypothesis 8;Organizational impedimentsare negatively related with creativity is rejected.

The impact of creative self-efficacy becomes inherent bridge between several external and internal factors of an individual towards creativity. Creativity is described as the outcome of intrinsic motivation ofan individualon the way to creative task that is something from within. Similarly creative self-efficacy is also internal inclination and intention sort of feeing that determines one's creative behaviour (Jaiswal & Dhar, 2006). It acts as an internal driving force and potential to carry out creative outcomes. It alsointellectually stabilize, make flexible and confident oneself to do what employees likes (Mathisen & Bronnick, 2009). Thus, H9 is accepted in alignment with aforesaid research findings.

Mediation of creative self-efficacy has proved to be true through this study between climate for creativity and creativity as hypotheses 10 to 13regarding organizational encouragement, supervisory encouragement and work group support and their subsequent effects on creativity were concerned. Results have been in line with study of Chong and Ma (2010)Encouragement and freedom of all natures in organization leads towards creative self efficacy because these phenomena make an individual psychologically flexible in thinking, stable and convinced as depicted in studies of Mathisen (2011), Tierney& Farmer (2010) and Tierney & Farmer (2011).

H14 and H15 of challenging work and sufficient resources have been rejected because of absence of direct effects of sufficient resources and creativity and challenging work and creativity during determination of direct effects. Challenge at work affects negatively to creativity by lowering motivation and confidence (Andrew & Farris, 1972). Challenging work is also associated and accompanied by job complexity in terms of new skills, time and methods, which puts burden on the individuals (Tierney & Farmer, 2002) that eventually lowers one's efficacy for something. Thus, creative self-efficacy doesn't prove to intervene between the relationship of challenging work and creativity.

Organizational work load pressures impact creativity adversely but fluctuates under the bridging role of creative self-efficacy. This is because workload pressures propose physical and psychological burdens which in turn diminish self control and confidence of the individuals. Therefore hypothesis 16; Creative Self-efficacy mediates the relationship between work load pressure and creativity has been accepted.Organizational hindrances or impediments hinder, block or undermine creativity (Cook, 1998) leading to effect individual's self-efficacy. Therefore, such factors influence creativity even under the creative self-efficacy, stimulating to support the of hypothesis 17 in this study.

Conclusion

The research extended and examined theoretical underpinning of how climate of creativity influences creativity of the employees in R&D of IT directly and indirectly through creative self-efficacy. The results have significant implications for both academia and practitioners. First, the results proved dyadic interaction that climate for creativity plays a significant role in determining creativity of the employees. Several facets of the climate for creativity, more or less, influence employee's creativity levels, which provides base line for relevant policy inmplications. Direct and indirect effects of various dimensions of climate for creativity have been established on

creativity but contrary to expectations few dimensions of climate for creativity is not recognized. This is a matter of eye opening for policy makers and strategy developers of R&D in IT sector. It is also a point to ponder for academicians who works in field of creativity and climate dynamics.

Second, the results also demonstrated mediation of creative self-efficacy across various dimensions of climate for creativity and creativity. Hence the association between climate for creativity and individual's creativity cannot merely be established as causal but also indirectly through mediators like creative self-efficacy. This describes that various studies have reported diverse results (Hsu & Fan, 2010; Isaken et al., 2001; Kim & Lee, 2011; Svedahl et al., 2015) regarding creativity and the work environment.

Limitations and Future Research

This study has used dyadic sample to explain dynamics of creativity in IT R&D of Pakistan. Self-reported questionnaire was avoided to reduce social desirability biasin terms of creativity of the individual (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, there are few limitations of this study. First, the data gathered for this study was comprised of the limited sample and future research can utilize options of different type of sampling as well as diversification of sample size. Second, generalizeability of the study becomes limited because of the difference of developing and developed countries' cultural differences and theoretical implications as culture affects behaviours of individuals (Singelis & Brown, 1995).Third, this study only considered bosses and employees related to R&D in IT sector. In order to realize better understanding of creative process in IT firms, future studies can focus on other functional areas. Next, this model was particularly tested in IT sector, so it can also be tested in other sectors to attain greater generalizeability and theoretical contribution. Last, the data were gathered in time lags with a break of 1 month due to time constraints, yet future studies could be longitudinal in R&D of IT sector for more valid results. Next, this study have used CSE as the psychological mechanism between social environment and creativity, future research may explore other intervening psychological factors to act as a bridge between the casual relationships. Similarly, various other models of climate for creativity can also be employed in the same study setting to measure various outcomes with diverse mediating and moderating mechanisms.

References

Aljanabi, A. R. A. (2018). The mediating role of absorptive capacity on the relationship between entrepreneurial orientation and technological innovation capabilities. *International Journal of Entrepreneurial Behavior& Research, 24*(4), 818-841.

Alotaibi, K. N. (2016). Psychometric Properties of Creative Self-Efficacy Inventory among Distinguished Students in Saudi Arabian Universities. *Psychological reports, 118(3*), 902-917.

Amabile, T.M. (1983), 'The social psychology of creativity'*, Journal of Personality and Social Psychology,* 45, 357–376.

Amabile, T.M. (1996), Creativity in Context*, Boulder, CO: Westview Press*.

Amabile, T.M. (1997), 'Motivating creativity in organizations: on doing what you love and loving what you do', *California Management Review*, 40:39–58.

Amabile, T.M., Conti, R., Coon, H., Lazenby, J., and Herron, M. (1996), 'Assessing the work environment for creativity', *Academy of Management Journal*, 39, 1154–1184.

Amabile, T.M., Khaire, M. "Creativity and the Role of the Leader." *Harvard Business Review* ,86 (10)

Bandura, A. (1997). Editorial. *American Journal of Health Promotion*, *12*(1), 8-10.

Bandura, A. (2007). Much ado over a faulty conception of perceived self–efficacy grounded in faulty experimentation. *Journal of Social and Clinical Psychology,* 26(6), 641-658

Band ,C. (2014).An ethnographic interpretation of the work environment within a creative culture in the advertising sector **.***A thesis submitted in partial fulfilment of the requirements of Edinburgh Napier University, for the award of Doctor of Business Administration*

Barron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51(6), 1173-1182.*

Batey, M. (2012). The Measurement of Creativity: From Definitional Consensus to the Introduction of a New Heuristic Framework. *Creativity Research Journal*, 24(1), 55-65

Boyce, S.Y. (2012). Key Influences on Managerial Creativity and Organizational Innovation for Knowledge-based Organizations: Three I's to Value. *International Journal of Humanities and Social Science,* 2(3), 87

Carmeli, A., Reiter-Palmon, R., &Ziv, E. (2010). Inclusive leadership and employee involvement in creative tasks in the workplace: The mediating role of psychological safety. *Creativity Research Journal*, *22*(3), 250-260.

Chen, C.J., Shih,H.A.& Yeh, Y.C. (2011). Individual initiative, skill variety, and creativity: the moderating role of knowledge specificity and creative resources. *The International Journal of Human Resource Management,* 22(17), 3447-3461

Chin, W. W., Gopal, A., & Salisbury, W. D. (1997). Advancing the theory of adaptive structuration: The development of a scale to measure faithfulness of appropriation. Information systems research, 8(4), 342-367.

Chong, E., & Ma, X. (2010). The Influence of Individual Factors, Supervision and Work Environment on Creative Self-Efficacy. *Creativity and Innovation Management,* 19(3), 233-247.

Cook, P. (1998). The creativity advantage-is your organization the leader of the pack?. *Industrial and commercial training*, *30*(5), 179-184.

Coveney, B. H. (2008). Assessing the organisational climate for creativity in a UK public library service: A case study. *Library and Information Research*, *32*(102), 38-56.

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of research in personality*, *19*(2), 109-134.

Diliello, T. C., Houghton, J. D., & Dawley, D. (2011). Narrowing the creativity gap: The moderating effects of perceived support for creativity. *The Journal of psychology*, *145*(3), 151-172.

Djukic, M., Kovner, C. T., Brewer, C. S., Fatehi, F. K., & Cline, D. D. (2013). Work environment factors other than staffing associated with nurses' ratings of patient care quality. *Health Care Manage Rev,* 38(2), 105-114.

Dul, J., Ceylan, C., & Jaspers, F. (2011). Knowledge workers' creativity and the role of the physical work environment. *Human resource management*, 50(6), 715-734.

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European journal of work and organizational psychology*, *5*(1), 105-123.

Ekvall, G., &Tångeberg-Andersson, Y. L. V. A. (1986). Working climate and creativity: A study of an innovative newspaper office. *The Journal of Creative Behavior*, *20*(3), 215-225.

George, J.M. (2007). Creativity in Organizations. *The Academy of Management Annals*, 1(1), 439-477

Girdauskienė L., Sakalas, A., &Savanevičienė, A. (2012). Human Resource Management in a Creative Organization. *International Conference on Economics Marketing and Managemen*t, IPEDR 28, Singapore

Hair, J.F., Ringle, C. and Sarstedt, M. (2011), "PLS-SEM: indeed a silver bullet", *The Journal of Marketing Theory and Practice,* 19 (2), 139-152.

Hair, J.F., Hult, G., Ringle, C. and Sarstedt, M. (2014), A Primer on Partial Least Squares Structural Equation Modeling, Long Range Planning, 1st ed., Sage, Singapore.

Hassi, A. (2019). Empowering leadership and management innovation in the hospitality industry context: The mediating role of climate for creativity. *International Journal of Contemporary Hospitality Management*.

Hayes, A. F., &Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: Does method really matter?. *Psychological science*, *24*(10), 1918-1927.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American psychologist*, *44*(3), 513.

Hsu, M. L. A., & Fan, H.-L. (2010). Organizational Innovation Climate and Creative Outcomes: Exploring the Moderating Effect of Time Pressure. *Creativity Research Journal,* 22(4), 378-386.

Hu, H. Y., & Chen, T. Y. (2019, March). Exploration Nature of Technological Creativity. In *Society for Information Technology & Teacher Education International Conference* (pp. 1141-1148). Association for the Advancement of Computing in Education (AACE).

Isaksen, S. G., Lauer, K. J., &Ekvall, G. (1999). Situational outlook questionnaire: A measure of the climate for creativity and change. *Psychological reports*, *85*(2), 665-674.

Isaksen, S. G., Lauer, K. J., Ekvall, G., &Britz, A. (2001). Perceptions of the best and worst climates for creativity: Preliminary validation evidence for the situational outlook questionnaire. *Creativity research journal*, *13*(2), 171-184.

Isaksen, S. G., &Akkermans, H. J. (2011). Creative Climate:A Leadership Lever for Innovation. *Journal of Creative Behavior,* 45(3).

Jaiswal, D., & Dhar, R. L. (2016). Impact of perceived organizational support, psychological empowerment and leader member exchange on commitment and its subsequent impact

on service quality. *International Journal of Productivity and Performance Management,* 65(1), 58-79.

Juniper, D. (1996). Human resource and creativity. *Work Study*, 45(7), 15 – 22

Kaufman, J. C., &Glaveanu, V. P. (2019). 2 A Review of Creativity Theories. *The Cambridge Handbook of Creativity*, 27.

Klijn, M., &Tomic, W. (2010). A review of creativity within organizations from a psychological perspective. *Journalof Management Development,* 29(4), 322-343.

Lemons, G. (2010). Bar drinks, rugas, and gay pride parades: Is creative behavior a function of creative self-efficacy?.*Creativity Research Journal*, 22(2), 151-161.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annu. Rev. Psychol.*, *58*, 593-614.

Mathisen, G. E., &Einarsen, S. (2004). A Review of Instruments Assessing Creative and Innovative Environments within Organizations. *Creativity Research Journal,, 16(*1), 119-140.

Mathisen, G. E. (2011). Organizational Antecedents of Creative Self-Efficacy. Creativity and Innovation Management, 20(3), 185-195.

Mathisen, G. E., &Bronnick, K. S. (2009). Creative self-efficacy: An intervention study. *International Journal of Educational Research*, *48*(1), 21-29.

Mobarakeh, N.S. (2011). The relation between the organizational culture and creativity of managers and experts of Khuzestan physical education organization. *Procedia Social and Behavioral Sciences 15,*3648–3650

Neal, A. Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behaviour .*Safety Science,* 34(2000), 99-109.

Nybakk, E., Crespell, P., & Hansen, E. (2011). Climate for Innovation and Innovation Strategy as Drivers for Success in the Wood Industry: Moderation Effects of Firm Size, *Industry Sector, and Country of Operation. Silva Fennica research articles*, 45(3).

Parke, M. R., &Seo, M. G. (2017). The role of affect climate in organizational effectiveness. *Academy of Management Review*, *42*(2), 334-360.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879.

Perry-Smith, J. E., &Mannucci, P. V. (2017). From creativity to innovation: The social network drivers of the four phases of the idea journey. *Academy of Management Review,* 42(1), 53-79.

Robinson, J.R. (2008). Webster's Dictionary Definitions of Creativity. *Online Journal of Workforce Education and Development,* 3(2)

Runco ,M. Paek, S.H. &Jaeger,G. (2015). Is Creativity Being Supported? Further Analyses of Grants and Awards for Creativity Research, *Creativity Research Journal*, 27:1, 107-110

Sarooghi, H., Libaers, D., &Burkemper, A. (2015). Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors. *Journal of business venturing, 30*(5),714-731.

Singelis, T. M., & Brown, W. J. (1995). Culture, self, and collectivist communication: Linking culture to individual behavior. *Human communication research*, *21*(3), 354-389.

Slåtten, T. (2014). Determinants and effects of employee's creative self-efficacy on innovative activities. *International Journal of Quality and Service Sciences*, *6*(4), 326-347.

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of management Journal, 38*(5), 1442-1465.

Stein, M.I. (1993). Creativity is People. *Leadership & Organization Development Journal, 12* (6), 4 – 10

Svedahl, S. R., Svendsen, K., Romundstad, P. R., Qvenild, T., Strømholm, T., Aas, O., & Hilt, B. (2016). Work environment factors and work sustainability in Norwegian cooks. *International journal of occupational medicine and environmental health, 29*(1), 41-53.

Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management journal, 45*(6), 1137-1148.

Tierney, P., & Farmer, S. M. (2011). Creative self-efficacy development and creative performance over time. *Journal of Applied Psychology*, *96*(2), 277.

Tseng, H. M., & Liu, F. C. (2011). Assessing the Climate for Creativity (KEYS): Confirmatory factor analysis and psychometric examination of a Taiwan version. *International Journal of Selection and Assessment, 19(4),* 438-441.

Umar, h., usman, s., &purba, r. B. (2018). The influence of internal control and competence of human resources on village fund management and the implications on the quality of village financial reports. *Int. J. Civ. Eng. Technol*, *9*(7), 1523-1531.

Verbeke, W., Franses, P. H., Blanc, A. L., & van Ruiten, N. (2008). Finding the keys to creativity in ad agencies: Using climate, dispersion, and size to examine award performance. *Journal of Advertising*, *37*(4), 121-130.

Voigt, C., Unterfrauner, E., Aslan, T., & Hofer, M. (2019). Design Thinking with Children: The Role of Empathy, Creativity and Self-Efficacy.*FabLearn, New York City, New York USA*

Vroom, V. (1964). Expectancy theory. *Work and motivation*.

Wang, G., & Ma, X. (2013). The Effect of Psychological Climate for Innovation on Salespeople's Creativity and Turnover Intention. *Journal of Personal Selling & Sales Management, 33*(4), 373-387.

Wang, C. J., Tsai, H. T., & Tsai, M. T. (2014). Linking transformational leadership and employee creativity in the hospitality industry: The influences of creative role identity, creative self-efficacy, and job complexity. *Tourism Management, 40*, 79-89.

Woodman, R., E.Sawyer, J., &W.Griffin, R. (1993). Toward a Theory of Organizational Creativity. *Academy of Management Journal, 18(2),* 293-321.

Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management journal*, *44*(4), 682-696.

Zhu, Y. Q., Gardner, D. G., & Chen, H. G. (2018). Relationships between work team climate, individual motivation, and creativity. *Journal of Management*, *44*(5), 2094-2115.