

Knowledge Creating Capabilities and Academic Entrepreneurship

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Abstract: Knowledge management (KM) needs a systematic approach to develop capabilities that accelerate the evolution of knowledge as a key organizational resource. The purpose of this study was to investigate the impact of knowledge creating capabilities on academic entrepreneurial motivation in universities and mediating effect of self-esteem in this relationship. Motivational level of academic entrepreneurs is a strong predictor of commercialization initiatives and performance. The cultural and structural differences between universities and industry enforce to devise specific capability frame works to ensure successful completion of entrepreneurial activities. Data was collected from 8 universities in Pakistan. The purposive sampling was used to collect data from academic researchers and various statistical tools applied to the collected data. The results indicated that support of organizational structural, technological and cultural capabilities plays a remarkable role to boost up the academic entrepreneurs' self esteem.

Key words: Technology • Culture • Structure • Motivation • Academic Entrepreneurship • Knowledge Management

INTRODUCTION

Knowledge is recognized as a strategic source for organizations to strengthen innovation capabilities in today's dynamic environment with a high level of uncertainty. Industries are seeking sources of new knowledge to foster development and innovation [1]. In this regard, management practitioners are structuring work environments building interactions to smooth the progress of knowledge creation. Marion, Dunlap and Friar [2] noted that universities, as the knowledge organizations, are making vital contributions in economic development through continuous generation of new knowledge and enabling technology transfers. In the last decade, role of universities has been evolving. Addition to the traditional responsibility of teaching and research, a "third mission" of universities has come into sight emphasizing commercialization and entrepreneurial activities [3, 14, 25, 32]. Contract research, patenting licensing, collaborative research, consulting and entrepreneurial activities are significant means to transform university knowledge into commercialized

products and services [4,49,48]. However, academic entrepreneurship is a broader concept. In addition to university-industry interactions, patenting, licensing, it includes creating technology transfer offices, development platforms and university based spin-offs [5,10]. Researchers Gausul Hoq and Akhter identify two major mainstreams in the history of academic commercialization and entrepreneurship. The first stream, from 1980s, is marked as technology transfer stream. This stream focused on identifying the barriers to knowledge creation and commercialization process. In this regard, university policies, environmental conditions, conflicting interests of stakeholders and funding sources remained the center of discussion in literature for long time. These factors caused researchers to overlook the significance of exploring requisite university capabilities to overcome the barriers of entrepreneurial activities. Then, in early twenty first century, second research mainstream brought forward the critical role of organizational capabilities or resources and also considered re-adjustment of university infrastructure according to the specified need of entrepreneurial practices. Structure, culture and

technology are those infrastructural components that enable universities knowledge creation, sharing, dissemination and application- knowledge management processes [6,18, 41].

Effectiveness of knowledge management processes, practices, interventions has become a major concern to management guru's for survival in the knowledge based economy. Management researchers and practitioners have extensively explored and determined knowledge types and processes in diverse industrial organizations [7,10, 31]. Knowledge management principles and practices are gaining similar attention in academia as in other organizations in the industry, due to recognized status of universities as most significant knowledge centers. Recently, strategic significance of knowledge management capabilities in deploying knowledge resources has pulled attention and raised the issue of determining capability characteristics specific to each business domain [8,17].

Gausul Hoq and Akhter [9,18] pointed out the value of developing appropriate university knowledge management systems to foster knowledge creation and sharing. These knowledge management systems are based on explicit frameworks of knowledge capabilities or resources. Further, in this regard, human behavior should be under careful consideration while designing the KM capability frameworks, as human psychology make up and behavior is majorly influenced by the environment in which it performs. Stressing and volatile work environment enhance the need to strengthen psychological capabilities of workforce, enabling individuals to boost motivation and uplift performance. Motivational level of academic entrepreneurs is a strong predictor of commercialization initiatives and performance [10,26,45]. There is lack of theoretical and empirical studies that investigate the cognitive and psychological make-up supporting entrepreneurial behavior [11,4,46]. Moreover, cultural and structural difference between universities and industry enforces to devise specific capability frame works to ensure successful completion of entrepreneurial activities. As a key component of the knowledge management system, academic entrepreneurs require university capabilities or resources to increase the knowledge initiatives and outcomes. Therefore, based on the research gap identified through extensive research review, this research determines appropriate knowledge management capability characteristics, in regard to knowledge creation, to build academic entrepreneurial motivation. Further, role of mediating effect of self-esteem

(psychological strength) is also determined on the relationship of university knowledge management capabilities and academic entrepreneurial motivation.

Literature Review: Global economic dynamics have equally pressurized universities, as other industrial organizations, to seek opportunities and deploy resources to foster knowledge creation and innovation to sustain competitive advantage. Recently, in regard to knowledge creation in universities, academic entrepreneurship has been increasingly recognized. Extensive research has been conducted to examine commercialization processes, entrepreneurial activities and possible consequences. However, review of the academic literature highlights that academic entrepreneur, key component of the commercialization process, has not gained the due attention in the research mainstream. There is need for further analysis of factors as drivers for entrepreneurial motivation among academic entrepreneurs [12,27]. Marion, Dunlap and Friar [13,26] discussed role of tenure status, networking efforts in commercialization success and carefully elaborates the differences among academic entrepreneur and industrial researcher. According to Marion et,al [14,26], academic entrepreneur derives direct advantage (though non-monetary) from research performance in the form of peer recognition and publication. Over time, faculty, in universities gained experience and better process commercialization activities and also influence entrepreneurial activities of other individuals. Limited research on academic entrepreneur stresses the need to extend this domain of study considering different attitudinal, psychological and behavioral elements like academic entrepreneurial motivation and psychological strengths (self esteem, hope, optimism and trust) of individuals, as subject to be investigated. Wood, [15,47] identified significant relation of these individual attributes with entrepreneurial initiatives and performance.

Level of human capital is also determined to have positive relation with success in technology transfers efforts by faculty members. Most of the research initiatives regarding entrepreneurial motivation were focused more on university level than on individual level. Marion, Dunlap and Friar [16,26] state that sufficient human and financial capital facilitates academic researchers to move ahead and make efforts avail opportunities leading to new business enterprise. There is clear evidence of collaborative research efforts increasing commercialization success. Entrepreneurial

motivation is imperative for academic individuals to complete time taking commercialization procedures, converting knowledge into profitable products and services. It allows individuals to seek opportunities and deploy resources to execute commercialization activities.

Thursby and Kemp [17,44] state that entrepreneurial activities in academia depend upon university capabilities and internal system. In order to perform the additional responsibility of teaching and research, commercialization, universities need to develop the requisite capabilities. In this regard, knowledge creation, in form of new products and service, is a key performance measure. Universities, as the hub of knowledge creation, are responsible for developing human capital to enable innovation in the knowledge-based economy. Therefore, it is vital for universities to develop effective knowledge management systems based on capability frameworks for the smooth progression of knowledge based processes-creation, sharing, dissemination and application [18]. Further, Gold et. al.[16] highlights commonly marked benefits of knowledge management capability including superior collaborations, capacity to innovate and quick commercialization of new knowledge. In pursuit of new ideas and knowledge universities are building their knowledge management infrastructure [19]. Knowledge is generated during the interaction of socio-technical components of the organization. University's performance as a knowledge source is relying on the structural, technological and cultural framework. Existing research marks evident contribution of university culture and structure in strengthening university ability to commercialize technology [20,8].

Structural knowledge management capabilities have a prominent role in organizing knowledge sharing and creation activities. Rigidity in structure restrains knowledge flow across units, departments and beyond organizational boundaries. Developments and re-framed structures of corporate sector have extended ripple effect to the boundaries of academia, demanding reorganization of university structures [21,36]. Non-hierarchic structure permit collective behavior and flexibility in work design leading to creativity and innovation. The structural framework of knowledge capability is determined by appropriate organizational policies, procedures, reward systems and incentives. It is presumed that these structural elements of the capability framework should be crafted with the intention to motivate and reward employees to spend time on knowledge sharing to ensure creation of new knowledge. Gold *et al.* [22,16] presented

and elaborated key indicators of structural capability to create knowledge through extensive review of prior research. These indicators reflect that such structures support knowledge exchanges and lesson learning activities of specific interest groups. Further, conferences and training should be a regular part of knowledge management system. Similarly, socialization of the faculty and researchers enhances speed the process of knowledge creation, which is possible with flexible university structure. Markman *et al.* [23,28] determined in his research that collaborative research work has more positive impact on innovation speed. Combined effort has better research outcomes enhancing commercialization. Doorri and Talebnejod, [24,11] prominently identified rigid university structure as a hurdle to knowledge creation. Bureaucratic command structures limit entrepreneurial capabilities of academic staff, intensifying competitive pressures to innovate and combat challenges. Breznitz [8] reported structural change, removal of one reporting line, improved technology commercialization at Georgia Tech in 2010.

Self-esteem, as a significant psychological state of individuals, demonstrates strong relationship with employee performance. Employees perception regarding satisfactoriness of fulfilling their task objectives and worth in the organization is significantly influenced by the organizational environment. It is predicted on the base of the experiences one has at the workplace. Researchers identified several sources of positive individual's organization based self-esteem, including organizational structures, peer evaluation and self-efficacy and one's opinion about their expertise. Organizational structures comprising characteristics such as rigidity, centralization and individualism are highly mechanistic and deemed elevated control on collaborations, thus demoralizing knowledge sharing and creation [25,34].

Based on the Review of Research Literature, it Is Assumed That:

H1: University structural knowledge creating capabilities increase academic entrepreneurial motivation

H2: University structural knowledge creating capabilities increase self esteem of university entrepreneur

Culture is marked as a significant organizational capability to foster individual collaborations and dialogue. These collaborations are necessary to the process of

knowledge creation by allowing individuals to convey tacit knowledge to others or to transform tacit to explicit knowledge [26,16]. The organizational culture is the amalgamation of values, beliefs, norms shared among the organizational members. Culture is reflected through the organizational vision and value system, depicting overall strategic direction. Explicit cultural characteristics provide individuals sense of purpose and allow them to align their tasks to strategic objectives. Appropriate cultural capabilities are a pre-requisite for effective execution of knowledge practices. Universities, as knowledge organizations, are also required to adjust cultural characteristics according to the evolving strategic responsibility [27,35, 37].

Knowledge creation in universities, key to entrepreneurship, is possible by means of building appropriate cultural characteristics. Aujirapongpan *et al.* [28,5] determined several indicators of knowledge management capabilities to build frameworks supporting knowledge processes and helping to make knowledge transfer more systematic and streamlined. These indicators and review of several other researches reflect that knowledge creation is achieved through promoting learning culture and collective behavior [29,37]. Individuals are encouraged to explore experiment and take initiatives to speed innovation. Expertise and knowledge are recognized and failures are ignored. Thus, emphasis is more on building strengths rather than highlighting weaknesses. Sharing of knowledge is supported not only within organizations, but also among other stakeholders [30,16]. In addition, clearly stated vision and mission statements indicate the type of knowledge and activities required to deliver results in congruence with organizational strategy. Further, Siadat, Hoveida, Abbaszadeh and Moghtadaie, [31,41] determine that culture supporting knowledge sharing and creation enhances group commitment. Culture also determines the social structure indicating the characteristics of social environment created by individuals to comply with organizational value system.

Cultural values emphasizing creativity and innovation instill urge for knowledge advancement in individuals [32,42]. The notion that organizational culture shapes values similarly extends to their beliefs and behaviors. Individual's self esteem- beliefs regarding their competence and worth in organizations are based upon the way they are treated at their workplace. Perusal of the research mainstream in the domain of self esteem reveals that self esteem is influenced by the messages

communicated through the culture. Cultures supporting open communication and collaborations are positively influencing organization based self-esteem. The factors common to the cultural characteristics and knowledge creating cultural capabilities are trust in relationships and respect and recognition of individuals. Thus, based on the clear evidence and support of the prior research, this research assumes

H3: University cultural knowledge creating capabilities increase academic entrepreneurial motivation

H4: University cultural knowledge creating capabilities increase self esteem of university entrepreneur

The technical components of the knowledge management system in the form of software and hardware and other networking tools enable smooth flow of information and knowledge. Right blend of technological tools enhances the organizational flexibility and reduces information chaos. Thus, examining the role of IT structure in universities, it is equally significant in effective implementation in knowledge management practices. In context of knowledge creation, the collaboration, distributed learning and discovery dimensions of technological infrastructures facilitate the required interaction and locate the new knowledge [33,16]. University's web portals and other software allow faculty, researchers and other stakeholders to share, create, store and disseminate knowledge for successful knowledge management activities [34,18]. There is strong evidence of IT infrastructure enhancing individual and group knowledge interactions internal and external to organizations in KM literature [35,50].

Aspiration to put technology into practice is one of the psychological reasons of entrepreneurial motivation [39] writes that entrepreneurial motivation is linked to development of technology and the availability of resources or capabilities. Based on the principle of distributive justice, organizational based self esteem of employees relies on their perception regarding sufficiency of information and resources to perform the designated role. Individuals provided with large data bases and collaboration tools, perceive to have expertise to create knowledge assets, giving them strong sense of worth in the organization. Accessibility and availability of these knowledge stocks further depicts management trust and support in employees, strengthening their self worth in organization. Pierce and Gardner [36,33] state that

technological infrastructure providing self-control enhances OBSE. Based on the review of literature and above discussion, this research proposes

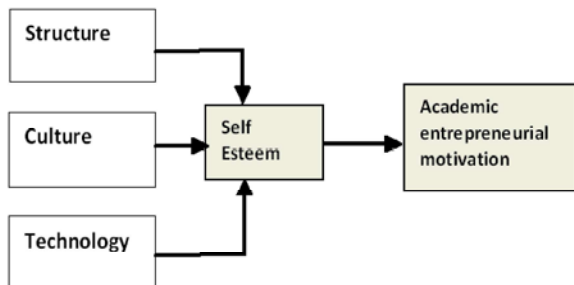
H5: University technological knowledge creating capabilities increase academic entrepreneurial motivation

H6: University technological knowledge creating capabilities increase self esteem of university entrepreneur

Self-esteem has been extensively explored in relation to its antecedents and consequences. Research studies determine significant relationship of self-esteem in enhancing job satisfaction, career orientation, performance, commitment, extra-role performance and diminishing turnover and its intentions. Individuals with high self-esteem are assumed to combat strongly against the adverse effects of organizational environment [37,20]. Role of self-esteem in developing work motivation is also explored and evident in several studies [38,19,20,30]. Korman, [39,22] elaborates self-consistency motivation that individuals will involve in those tasks which are consistent with their self-image[40,24,33]. Knowledge creating cultures in universities promote entrepreneurial behavior among individuals which builds their sense of responsibility to participate in entrepreneurial activities and generate profitable outcomes. Thus based on the theory stated above regarding this research examines the relationship of self-esteem in university settings

H7: Organization (University) Based Self-Esteem enhances academic entrepreneurial motivation

Conceptual Framework:



MATERIALS AND METHODS

In order to examine, the impact of knowledge creating capabilities on academic entrepreneurial motivation in universities and mediating effect of self-esteem in this

relationship, a questionnaire was structured based on two sections. Before developing the questionnaire comprehensive review of literature was done to understand the theoretical underpinnings of the variables composing the framework. Items from prior research studies were adapted for each variable included in the study. The questionnaire items were reviewed by academicians and industry experts for content validation. Items were modified according to the expert suggestions. Pilot test was also conducted to determine the reliability of the questionnaire. The first section of the instrument included demographics (age, gender, qualification etc). The second section included total 28 items of all the constructs including organizational structural, cultural, technological knowledge creating capabilities and organization(university) based self-esteem rated on a likert scale from strongly disagree (41,1) to strongly agree (7).The measurement of universities on structural, cultural and technological knowledge creating capabilities was based on the scale adapted from [42,16].The original scale was initially developed for assessment of knowledge management capabilities supporting knowledge processes including knowledge sharing, creating, storing and applying. Assessment of structural, cultural and technological knowledge capabilities in context of knowledge creation is enabled, by drawing 6 items relevant to each capability. To ensure that all the items confirm with the theory of knowledge creating capabilities, the content was matched with the organizational knowledge creating capability indicators specified by [43,5]. The items for organization based self esteem were adapted from [44,20]. This scale allows us to meet the study objectives, examining mediating effect of academic entrepreneurs self esteem developed on the basis of their interaction with organizational resources, specifically structural, cultural and technological knowledge creating capabilities of universities. The measurement of individual’s academic entrepreneur’s motivation in universities is based on the 4 items adapted from the instrument developed by Marian et. al. [45,26]. The items assess desire of academic researchers to involve in entrepreneurial activities and in result gain financial benefits.

Sample: In view of the significance of the study, to examine the role of organizational knowledge creating capabilities and psychological strengths on academic entrepreneurial motivation, the study focused on the education sector of Pakistan. The sample comprised of academic researchers including faculty, research staff and

students from different departments of private and public universities of main cities of Pakistan. Non probability purposive sampling was used to collect data from academic researchers. The questionnaire was rotated through the human resource department and the concerned managerial staff among academic researchers from diverse departments from 8 universities in Pakistan. The purpose of the study was conveyed to the sample in a cover letter attached to the instrument. The cover letter clearly stated the researcher academic intent for the study and assured them of confidentiality and anonymity of their responses. The researchers distributed 300 questionnaires. The received number of questionnaire was 258, out of which 237 were retained for the final data analysis because of various discrepancies in the data.

RESULTS AND ANALYSIS

This section of the paper deals with the results of the various statistical tools applied to the collected data. The results of descriptive statistics have been provided in.

Descriptive Statistics: Table 1 shows the descriptive statistics. This table shows the values of minimum, maximum, mean, standard deviation, skewness and kurtosis. All the values of minimum and maximum are within the ranges of the scale that shows the correctness of the data. The values of skewness and kurtosis have been calculated to check the normality of data. All the values of skewness and kurtosis are within the acceptable range i.e. $-1/+1$ that authenticates the normality of the data. The mean values of all the variables are showing that most the respondents have shown their agreement with the statements asked in the questionnaire.

Correlation Matrix: Table 2 is the correlation matrix that shows the correlation values between the variables of the study. All the independent variables have significant correlation with the dependent variable. These results confirm the presence of a linear relationship between IV and DV. Moreover, the correlation values among the independent variables negate the presence of multicollinearity.

Regression Analysis: The framework given in Figure 1 and hypotheses have been tested through regression analysis. The results of regression analysis have been reported in Table 3. The value of R here is .588 that shows the correlation of independent variables with the dependent variable. The value shows a moderate

correlation between IVs and DV. The value of R-Square is .345 that shows a 34.5% variation because of three factors i.e. structure, culture and technology, in academic entrepreneurial motivation. The model fitness has been authenticated as F -Statistics = 38.842 ($p < 0.01$).

The relationships of individual variables are evaluated here with the help of beta coefficients. The value of constant is 1.353 ($p < 0.01$). This shows the value of academic entrepreneurial motivation when all the independent variables are equal to zero. The beta coefficient for the variable of structure is .350. A one unit change in structure of the organization is likely to bring a .35 unit change in academic entrepreneurial motivation. This beta coefficient is significant here as the value of t -statistics $t = 6.219$ ($p < 0.01$). These results support H1. The beta coefficient of the culture is .302. This value shows a positive relationship between the culture and academic entrepreneurial motivation. A change of .302 units in DV can be expected because of one unit change in culture. The coefficient is significant here as shown by t -statistics i.e. 5.976 ($p < 0.01$). H2 is supported by these results. The coefficient of technology is .051. The negative sign indicates a negative relationship between technology and academic entrepreneurial motivation. However, the value of t -statistics i.e. 1.167 ($p > .05$) shows that this relationship is insignificant here. Thus, H3 is not supported by these results.

Mediation analysis: The present study has taken self-esteem as a mediating variable. The mediation has been tested through Baron and Kenny Method (1986). The mediation has been tested for each of the independent variable separately. The results have been reported from Table 4 to Table 6.

Table 4 shows the results of mediation testing for the relationship of Structure - Self-Esteem - Academic Entrepreneurial Motivation. The F statistic (57.389) for the regression between structure and AEM is 69.821 ($p < 0.01$), thereby proving a significant relationship between structure and AEM ($R^2 \neq 0$). The value of R^2 is 0.238 which shows a 23.8% variation in AEM because of structure. The value of beta coefficient is .447. The beta value shows that structure has a positive effect on AEM. The value of t -statistics is 8.356 ($p < 0.01$), which proves the presence of a significant impact of structure on AEM. The primary path proved significant here.

After checking the direct relationship of structure with AEM, the relation between structure (IV) and self-esteem (Mediator) has been tested. The F statistic is 69.514 ($p < 0.01$), which prove the presence of a

Table 1: Descriptive Statistics

	Min.	Max.	Mean	Std. Deviation	Skewness	Kurtosis
Structure	2.00	5.00	3.5770	.67250	-.237	-.251
Culture	1.60	5.00	3.4995	.71716	-.453	-.400
Technology	1.75	5.00	3.5135	.82117	-.226	-.628
Self-Esteem	2.60	5.00	3.8898	.54306	-.272	-.341
Academic Entrepreneurial Motivation	1.93	4.80	3.4812	.61533	.032	-.593

Table 2: Correlation Matrix

	Structure	Culture	Technology	Self-Esteem	Academic Entrepreneurial Motivation
Structure	1				
Culture	.370**	1			
Technology	.356**	.218**	1		
Self-Esteem	.487**	.258**	.280**	1	
Academic Entrepreneurial Motivation	.488**	.478**	.144*	.290**	1

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

Table 3: Regression Analysis

R	.588	F-Statistics	38.842
R-Square	.345	Sig.	.00029
Adjusted R-Square	.336	Regression Sum of Square	.28055
Std. Error of Estimate	.50127	Residual Sum of Square	.532

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	1.353	.223	.6077	.000	
	Structure	.350	.056	.382	6.219	.000
	Culture	.302	.051	.352	5.976	.000
	Technology	.051	.044	.068	1.167	.244

a. Dependent Variable: Academic Entrepreneurial Motivation

Table 4: Mediation Testing (Structure - Self Esteem - Academic Entrepreneurial Motivation)

Description	R	R ²	F-Stats	Sig.	Beta	t-Statistics	Sig.
Dependent variable: Academic Entrepreneurial Motivation							
Constant	.488	.238	69.821	.000	1.883	9.676	.000
Structure					.447	8.356	.000
Dependent variable: Self-Esteem							
Constant	.487	.238	69.514	.000	2.482	14.442	.000
Structure					.394	8.338	.000
Dependent variable: Academic Entrepreneurial Motivation							
Constant	.290	.084	20.477	.000	2.203	7.725	.000
Self-Esteem					.329	4.525	.000
Constant	.492	.242	35.435	.000	1.691	6.248	.000
Structure					.277	3.018	.000
Self-Esteem					.416	6.800	.000

relationship between structure and self-esteem ($R^2 \neq 0$). This was path 'a' in which a relationship of independent variable with mediator has been proved.

Path 'b' shows that a strong relationship exists between self-esteem and AEM. The *F* statistics (20.477) have a significance value of .000 ($p < 0.01$). The beta coefficient has a value of .329 and *t*-statistics 4.525 ($p < 0.01$). This proves that self-esteem has a significantly positive impact on AEM. This significant relationship

between self-esteem and AEM illustrates that mediation of self-esteem between structure and AEM can be tested for other variables (the mediator has a significant impact on the dependent variable). First three paths have been proved significant here. Therefore, path c has been performed to test the mediating effect of self-esteem between relationship of structure and AEM by controlling the effect of self-esteem here. The final path shows that the relationship of structure with AEM is insignificant

Table 5: Mediation Testing (Culture - Self Esteem - Academic Entrepreneurial Motivation)

Description	R	R ²	F-Stats	Sig.	Beta	t-Statistics	Sig.
Dependent variable: Academic Entrepreneurial Motivation							
	.478	.229	66.216	.000			
Constant					2.044	11.345	.000
Culture					.411	8.137	.000
Dependent variable: Self-Esteem							
	.258	.067	15.919	.000			
Constant					3.206	18.320	.000
Culture					.195	3.990	.000
Dependent variable: Academic Entrepreneurial Motivation							
	.290	.084	20.477	.000			
Constant					2.203	7.725	.000
Self-Esteem					.329	4.525	.000
	.509	.259	38.727	.000			
Constant					1.397	4.982	.000
Culture					.371	7.230	.000
Self-Esteem					.202	2.982	.003

Table 6: Mediation Testing (Technology - Self Esteem - Academic Entrepreneurial Motivation)

Description	R	R ²	F-Stats	Sig.	Beta	t-Statistics	Sig.
Dependent variable: Academic Entrepreneurial Motivation							
	.144	.021	4.748	.030			
Constant					3.101	17.311	.000
Technology					.108	2.179	.030
Dependent variable: Self-Esteem							
	.280	.079	19.019	.000			
Constant					3.238	21.115	.000
Technology					.185	4.361	.000
Dependent variable: Academic Entrepreneurial Motivation							
	.290	.084	20.477	.000			
Constant					2.203	7.725	.000
Self-Esteem					.329	4.525	.000
	.297	.088	10.767	.000			
Constant					2.107	7.024	.000
Technology					.051	1.026	.306
Self-Esteem					.307	4.057	.000

here. The value of *t*-statistic here is 3.018 ($p > 0.05$). These results negate the presence of complete mediation. However, the beta value has been reducing that confirms that presence of partial mediation. Hence, H_4 is supported.

Table 5 shows the results of mediation testing for the relationship of Culture - Self-Esteem - Academic Entrepreneurial Motivation. The *F* statistic (57.389) for the regression between culture and AEM is 66.216 ($p < 0.01$), thereby proving a significant relationship between culture and AEM ($R^2 \neq 0$). The value of R^2 is 0.229 which shows a 22.9% variation in AEM because of Culture. The value of beta coefficient is .411. The beta value shows that structure has a positive effect on AEM. The value of *t*-statistics is 8.137 ($p < 0.01$), which proves the presence of a significant impact of culture on AEM. The primary path proved significant here.

After checking the direct relationship of culture with AEM, the relation between culture (IV) and self-esteem (Mediator) has been tested. The *F* statistic is 15.919 ($p < 0.01$), which prove the presence of a relationship between culture and self-esteem ($R^2 \neq 0$). This was path 'a' in which relationship of independent variable with mediator has been proved.

Path 'b' shows that a strong relationship exists between self-esteem and AEM. The *F* statistics (20.477) have a significance value of .000 ($p < 0.01$). The beta coefficient has a value of .329 and *t*-statistics 4.525 ($p < 0.01$). This proves that self-esteem has a significantly positive impact on AEM. This significant relationship between self-esteem and AEM illustrates that mediation of self-esteem between culture and AEM can be tested for other variables (the mediator has a significant impact on

the dependent variable). First three paths have been proved significant here. Therefore, path c has been performed to test the mediating effect of self-esteem between relationship of culture and AEM by controlling the effect of self-esteem here. The final path shows that the relationship of culture with AEM is still significant here. The value of t -statistic here is 7.230 ($p > 0.05$). This negates the presence of a complete mediation. However, the beta coefficient for the culture has reduced here. This shows the presence of a partial mediation.

Table 6 shows the results of mediation testing for the relationship of Technology-Self Esteem-Academic Entrepreneurial Motivation. The F statistic (57.389) for the regression between structure and AEM is 4.747 ($p < 0.01$), thereby proving a significant relationship between technology and AEM ($R^2 \neq 0$). The value of R^2 is 0.21 which shows a 2.1% variation in AEM because of technology. The value of beta coefficient is .108. The beta value shows that technology has a positive effect of on AEM. The value of t -statistics is 2.179 ($p < 0.01$), which proves the presence of a significant impact of technology on AEM. The primary path proved significant here.

After checking the direct relationship of technology with AEM, the relation between technology (IV) and self-esteem (Mediator) has been tested. The F statistic is 19.019 ($p < 0.01$), which prove the presence of a relationship between technology and self-esteem ($R^2 \neq 0$). This was path 'a' in which relationship of independent variable with mediator has been proved.

Path 'b' shows that a strong relationship exists between self-esteem and AEM. The F statistics (20.477) have a significance value of .000 ($p < 0.01$). The beta coefficient has a value of .329 and t -statistics 4.525 ($p < 0.01$). This proves that self-esteem has a significantly positive impact on AEM. This significant relationship between self-esteem and AEM illustrates that mediation of self-esteem between Technology and AEM can be tested for other variables (the mediator has a significant impact on the dependent variable). First three paths have been proved significant here. Therefore, path c has been performed to test the mediating effect of self-esteem between relationship of technology and AEM by controlling the effect of self-esteem here. The final path shows that the relationship of technology with AEM is insignificant here. The value of t -statistic here is 1.026 ($p > 0.05$). This proves that there is a complete mediation.

Hence, H_4 is supported Table 6: Mediation Testing (Technology- Self Esteem - Academic Entrepreneurial Motivation).

DISCUSSION AND CONCLUSION

Higher education sector is distinguished by institutional diversity and how they are reacting towards the current situation, in order to cope up with the third mission assigned to them, that is knowledge creation and sharing capabilities. The purpose of this paper was to investigate, the impact of knowledge creating capabilities on academic entrepreneurial motivation in universities and mediating effect of self-esteem in this relationship, data was collected analyzed and the results were presented to confirm the hypothesis. In our review most of the empirical studies supports that individuals motivation and self esteem is formed at work and organizational experiences plays a significant role in scheming and shaping the employees motivation and self esteem. Moreover, most of the reviewed evidence supports that the organizational work environment, structure culture and technological advancement provides the chances and opportunities to the employees to become more self directed motivated and self control that results in prompting organizational based self esteem. Knowledge creation in the universities is accessed by the internal and external dimensions [46,11].

Combination and exchange of knowledge transfer requires the presence of social capital. Social capital is the sum of genuine and potential resources entrenched within and derived from the network of relationships possessed by a social unit. Structural infrastructure refers to the existence of trust and norm mechanism. Cultural dimension is view able from common circumstances. The descriptive statistic of the study describes that higher education institutions have not yet properly streamlined the structure, procedures, policies and rewards and incentives systems for knowledge creation activities but still we got few responses in which academic entrepreneurs' stated that organizational structure is supporting them in knowledge creation activities. The results show that Organizational based capabilities (structure, culture and technology) have positive relationship with employees motivation and sense of worth of employees. Result of the study discovered that motivation of academic entrepreneurs for commercialization of their academic research imitates the

two factors like one is the personal aspiration to undertake a commercialization of research and secondly the financial benefits in the form of rewards. Significant contribution of this study is the identification of the impact of knowledge creating capabilities on academic entrepreneurial motivation in universities and mediating effect of self-esteem in this relationship

The results show that the support of organizational structural capabilities plays a remarkable role to boost up the academic entrepreneurs' self esteem. Organizational structure, rules, policies, procedures, technology, reward and incentive systems are the complicated components of organizational knowledge sharing capabilities. Blenker *et al.* [7] Kirby [21] Gibb [15] highlighted that organizational structure is linked with the flow of work with specified patterns. Organizational chart is an observable representation of the whole organization activities and systems. Moreover three structural mechanism essential for transfer of technology in higher education institutions comprise of managerial, legal and communication instrument. Managerial procedures discuss about the role of management and the task of technology transfer that is disclosing an invention, facilitation and trust development. Legal mechanism concerns with production of fair rules and regulation [1, 6, 7, 29, 40].

The research results show that self esteem act as a mediator to motivate the academic researchers. The result match with the prior research findings as role of self-esteem in developing work motivation [23,13,12,3]. The results show that Technology acts as a powerful tool to make the organization flexible and to make it a hub of knowledge sharing activities. Technology is consisted of critical element of structural dimensions which is prerequisite for new knowledge creation. Information and communication system in an organization linked with the flow of scattered information. These linkages play an important role in elimination of obstacles of communication that mainly occurs in various parts of the organizations. Moreover, technology is multifaceted; it is prior for the organizations to invest comprehensively in infrastructure that is very important to support various types of complex technologies. Technological aspects are the part of effectual knowledge management comprises of business skills, teamwork, distributed learning, technology discovery, knowledge mapping, prospect production, as well as protection. Higher Education Institutions that motivate their employees for technology and innovation transfer results in strong academia

industry linkages and funds generations and in the end betterment of economic condition of country as a whole [38].

REFERENCES

1. Alimardani, M., M. Ghahremani and M. Abolgasemi, 2009. Relationship between organizational structure and corporate entrepreneurship Shahid Beheshti University, New approach in Educational Administration Journal, Marvdasht Islamic Azad University, 2(3): 131-144.
2. Aryan Gholipour (Iran), Badri Abbasi (Iran) University management challenges: unanticipated consequence of commercialization in Iranian higher education, Problems and Perspectives in Management, 7: 2.
3. Angkoon, K.K., R. Pichyangkura and A. Chandrachai, 2012. Academic scientist's motivation in research commercialization from National Research Universities in Thailand: An individual Level, *Journal of Economics and Sustainable Development*, ISSN 2222-1700 (Paper) ISSN 2222-285(Online), 3(9).
4. Audretsch, D.B. and D.K. Erdem, 2004. Determinants of scientist entrepreneurship: an integrated research agenda. Discussion, Paper #4204.
5. Aujirapongpan, S., P. Vadhanasindhu, A. Chandrachai and P. Cooperat, 2010. Indicators of knowledge management capability for KM effectiveness.
6. Begley, T. and D. Boyd, 2007. The relationship between organizational structure and entrepreneurial culture at the University of British Darham, *Journal of the National Entrepreneurship*, 3(59): 37.
7. Blenker, P., P. Dreisler, H.M. Fargemann and J. Kjeldsen, 2006. Entrepreneurship education the new challenge facing the universities-a framework or understanding and development entrepreneurial university communities.
8. Breznitz, S.M., R.P. O'Shea and T.J. Allen, 2011. University Commercialisation Strategies in the Development of Regional Bioclusters. Product Development and Management Association, 25: 129-142.
9. Choi, B. and H. Lee, 2002. "Knowledge management strategy and its link to knowledge creation process", *Expert Systems with Applications*, pp: 173-87.

10. D'Este, P. and M. Perkmann, 2011. Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, 36(3), 316-339.
11. Dorri, B. and A. Talebnejod, 2008. "Investigating the situation of the techniques of knowledge creation in the universities related to ministry of education, research and information technology", *Quarterly of Research and Programming in Higher Education*, No 49.
12. Dynamics of Human Resource and Knowledge Management Author(s): K. Hafeez and H. Abdelmeguid Reviewed work(s): Source: *The Journal of the Operational Research Society*, Vol. 54, No. 2, Special Issue: Knowledge Management and Intellectual Capital (Feb. 2003), pp: 153-164.
13. Elloy, D. and V. Patil, 2012. Exploring the Relationship between Organization-Based Self Esteem and Burnout: A Preliminary Analysis, *International Journal of Business and Social Science*, 3(9).
14. Feldam, M.P. and J. Bercovitz, 2006. "Entrepreneurial Universities and Technology Transfer: Conceptual Framework for Understanding Knowledge Based Economic Development." *Journal of technology Transfer*, 31: 175-188.
15. Gibb, A., 2002a. Creating conducive environments for learning and entrepreneurship: Living with, dealing with, creating and enjoying uncertainty and complexity. *Industry and Higher Education*, 16(3): 135-148.
16. Gold, A.H., A. Malhotra and A.H. Segars, 2001. "Knowledge management: an organizational capabilities perspective", *Journal of Management Information Systems*, 18(1): 185-214.
17. Grant, R., 1996. "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17, pp.22. http://szlibszpzt.net.cn/download/km_n_lib.ppt (accessed 19.06.03).
18. Hoq, K.M.G. and R. Akter, 2012. Knowledge Management in Universities: Role of Knowledge Workers. *Bangladesh Journal of Library and Information Science*, 2(1): 92-102.
19. Hillman, A.J., M.C. Withers and B.J. Collins, 2013. Resource dependence theory: A Review. *Journal of Management*, 35(6): 1404-1427.
20. Kanning, U.P. and A. Hill, 2012. Organization-based self-esteem scale adaptation in an international context. *Journal of Business and Media Psychology* 3(1): 13-21.
21. Kirby, D.A., 2002. Entrepreneurship education: can business schools meet the challenge? *International Council for Small Business - the 47th World Conference*, San Juan, June 16-19, 2002.
22. Korman, A.K., 1970. Organizational achievement, aggression and creativity: Some suggestions toward an integrated theory. *Organizational Behavior and Human Performance*, 6: 593-613.
23. Lam, Alice. 2010. What motivates academic scientists to engage in Research commercialization: 'gold', 'ribbon' or 'puzzle'? *Munich Personal*
24. Repec Archive Lawrence and Lorsch, 1967. A Review of Best Practices in University Technology Licensing Offices. *Spring*, pp: 57-69.
25. Lee, Hwa-Wei. 2000. The role of libraries in knowledge management.
26. Zinatul Ashiqin Zainol, 5, Wan Kamal Mujani, 5, 2 Ezad Azraai Jamsari, 6 Adibah Sulaiman and 7 Kamaruzaman Jusoff: Challenges for Commercialization of University Research for Agricultural Based Invention, *World Applied Sciences Journal* 12(2): 132-138, 2011 ISSN 1818-495 Commercialization, *Journal of Management Studies*, 46: 4.
27. Marion, T.J., D.R. Dunlap and J.H. Friar, 2012. The university entrepreneur: a census and survey of attributes and outcomes. *RandD Management*, 42, 5.
28. Markman, G.D., P.T. Gianiodis and P.H. Phan, 2009. Supply-Side Innovation and Technology.
29. Markman, G.D., P.T. Gianiodis, P.H. Phan and D.B. Balkin, 2005. Innovation speed: transferring university technology to market. *Research Policy*, 34: 1058-1075.
30. Mogli, A.R., 2010. Influencing organizational factors upon university entrepreneurship, *Iran Management Sciences Journal*, 5(19): 103-118.
31. Nicola Lacetera, 2009. Academic Entrepreneurship, managerial and decision economics, *Manage. Decis. Econ.* 30: 443-464.
32. Nonaka, I. and H. Takeuchi, 1995. *The Knowledge Creating Company: How Japanese Companies Foster Creativity and Innovation for Competitive Advantage*, Oxford University Press, New York, NY.

33. Noor Inayah Yaakub, Wan Mohd Hirwani W 1,2 1,3 an Hussain, 3Mohd Nizam Abdul Rahman,Pablo D'Ested, Riccardo Fini f, Aldo Geunae,l, Rosa Grimaldif, Alan Hughesm, Stefan Krabelh,Michael Kitsong, Patrick Llerenai, Franceso Lissonij, Ammon Salter a, Maurizio Sobrer of Academic engagement and commercialisation: A review of the literature on university industry relations. *Research Policy*. 42: 423- 442.
34. Pierce, J.L. and D.G. Gardner, 2004. Self-esteem within the work and organizational context: A review of the organization-based self-esteem literature. *Journal of Management*, 30: 591-622.
35. Pierce, J.L., D.G. Gardner, L.L. Cummings and R.B. Dunham, 2008. Organization-based self-esteem: Construct definition measurement and validation. *Academy of Management Journal*, 32: 622-648.
36. Ramachandran, S.D., S.C. Chong and K.Y. Wong, Knowledge management practices and enablers in public universities: a gap analysis, *Campus-Wide Information Systems*, 30(2): 76-94.
37. Rowley, J., 2000. Is higher education ready for knowledge management? *The International Journal of Education Management*, 14(7): 325-333.
38. Sandhawalia, B.S. and D. Dalcher, 2011. "Developing knowledge management capabilities: a structured approach", *Journal of Knowledge Management*, 15(2): 313 328.
39. Schulze, A. and M. Hoegl, 2008. "Organizational knowledge creation and generation of new product ideas: a behavioural approach", *Research Policy*, 37: 1742-5.
40. Shane, S., 2004. *Academic Entrepreneurship: University Spinoffs and Wealth Creation*. Edward Elgar, Cheltenham.
41. Shirpour, M., F. Amiri, J. Jasour and J. Shafae, 2012. Relationship between organizational structure and entrepreneurial culture in academic environment, *Journal of Basic and Applied Scientific Research*, 2(8): 7727-7733.
41. Sayed Ali Siadat, Reza Hoveida, Mohammad Abbaszadeh and Leila Moghtadaie, 2012. "Knowledge creation in universities and some related factors", *Journal of Management Development*, 31(8): 845-872.
42. Siegel, D., D. Waldman and A. Link, 2003. Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: an exploratory study. *Research Policy*. 32(1): 27-48 propertylicensing. *Research Policy*, 31(1): 109-124.
43. Tanha, D., A. Salamzadeh, Z. Allahian and Y. Salamzadeh, 2011. Commercialization of University Research and Innovations in Iran: Obstacles and Solutions. *Journal of Knowledge Management, Economics and Information Technology*.
44. Thursby, J.G. and S. Kemp, 2002. Growth and productive efficiency of university intellectual.
45. Tonis Mets, 2006. Creating a knowledge transfer environment The case of Estonian biotechnology, *Management Research News*, 29(12): 754-768.
46. Tucker J. Marion¹, Denise R. Dunlap and John H. Friar, The university entrepreneur: a census and survey of attributes and outcomes, *R and D Management*, 42: 5.
47. Wood, M.S., 2011. A process model of academic entrepreneurship. *Business Horizons*. 54: 153-161.
48. Wright, M., A. Lockett, B. Clarysse and M. Binks, 2006. University spin-out companies and venture capital. *Research Policy*, 35: 481-501.
49. Yi Wang and Lucy Lu, Knowledge transfer through effective university-industry interactions Empirical experiences from China, *Journal of Technology Management in China*, 2(2): 119-13.
50. Yian, J., Y. Nakamori and P.A. Wierzbicki, 2009. Knowledge management and knowledge creation in academia: a study based on surveys in a Japanese research university, *Journal Of Knowledge Management*, 13(2): 76-92.