

Fostering Innovation With Digital Mode By Integrating Knowledge Management Focus And Sources Into A Degree Of Knowledge: A Study Of Higher Education Of Pakistan

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Article Info	Abstract
<p>Article History</p> <p>Received: May 13, 2021</p> <p>Accepted: August 27, 2021</p> <hr/> <p>Keywords : Tacit and Explicit Knowledge, Knowledge base, Innovation outcome, Work Place Ethics, Higher Educational Institutes.</p> <p>DOI: 10.5281/zenodo.5297216</p>	<p><i>Knowledge management has got immense importance in the field of education. The current situation after the pandemic has taken digital mode at the forefront to encounter the emerging needs of educational institutions worldwide. It has drawn on knowledge management practices for bringing about Educational institution's innovation. Well-managed knowledge maintains competitiveness in the institution. This study aims to investigate the relationship between explicit and tacit knowledge by integrating sources of knowledge toward institutional innovativeness. Work ethics acts as a moderator between the relationship of degree of knowledge base and innovation. The population of the current study was the education sector of Pakistan. The sample of the current study is the higher education institutes of Pakistan operating in Rawalpindi and Islamabad. A survey questionnaire was used to collect the data. SEM results show that all of the study independent variables namely explicit and tacit knowledge, and sources of knowledge are positively and significantly related to Institutional innovation. Similarly, mediation and moderation are also partially accepted. Managerial and practical implications of the results and future research directions are emphasized in the study.</i></p>

Introduction

In the recent wave of Covid-19, much influence has been placed on the accountability of higher education institutions. This may be explicated by rising tuition fees, disappointing retention and graduation rates, employers' concern about insufficient knowledge and skills expected in the workplace, and the value of knowledge and skills provided to the students (Léveillé, 2006). If the objective of the evaluation is accountability, then institutions must demonstrate compliance with established procedures or performance standards (Ewell, 2009). It is therefore seen, they rely more on quantitative evidence, such as standardized tests and surveys. While the main goal is to compare institutions with established performance standards. In addition to requiring higher education to assume external responsibilities, higher education institutions are also facing increasing pressure from the government, policymakers, and other stakeholders, like students to improve the quality and effectiveness of education in higher education (Liu, 2011; Ewell, 2009). Internally, institutions also need to measure achievement and track their progress so that they can know where they stand, by overcoming shortcomings in teaching methodology, learning processes and to improve the quality of standards of education (Liu, 2011; Steedle, 2011). In response to growing demands, both externally and internally, on the quality of education, higher education institutions in Pakistan now focusing on the innovative outcome for digital mode. Faculty and students are not incumbent with such systems. The utility of digital mode would be enhanced if they strengthen the degree of the knowledge base by utilizing internal and external knowledge sources. Internally they develop knowledge through the up-gradation of infrastructure and make such an environment where knowledge can be nurtured. Zaied, Affes, and Louati (2015) observed that the knowledge which is generated and organized within in a certain organization is termed as internal knowledge.

Knowledge confined within the institutions may have restrictions and cannot spread properly. Normally, that is the knowledge that is created within the organization and considered precious. While internal knowledge can generate new ideas, the new skill within the organization. Tacit and explicit knowledge is also very important for innovation outcomes in educational institutions like Muhammad (2014) investigated that every action or activity within an organization involves the blend of both the explicit as well as tacit knowledge. Studies reveal that work ethic is another dependent factor to boost innovation in the organization. Knowledge **breath** would be more innovative in an educational institution if work ethics are strongly emphasized.

Literature Review

Knowledge management and its impact on digital innovation have been studied extensively. Akram, Nawaz, Ghauri, and Siddique (2011) investigated the ways and different methods to hold the innovation chain through knowledge creation and design. They also studied the desire of different companies by utilizing diverse models (medium, high, low) to bring innovation through effective knowledge generation. Eskandari et al. (2015) described that real KM can make the education process smooth and even more better if digital innovation and virtual networks are enabled. He builds on creative execution by cultivating new ways of thinking and new skills. Consistent with the literature to date, the results show that although knowledge management practices are indispensable even for innovation purposes, the existence of knowledge base management promotes the development and use of knowledge exploration and practice.

It is widely believed that the explicit and implicit parts of institutional knowledge play an important role in innovation. With the advent of knowledge management as a new discipline, it has become inevitable to combine knowledge management with innovation.

Tacit and Explicit Knowledge Management into the degree of Knowledge base and Innovative outcomes

Muhammad (2014) found that any related activity requires the amalgamation and support of tacit as well as explicit knowledge. Employees receive information from meetings, societies in different associations. Examples of explicit knowledge are choices, actions, events, strategies, archives, procedures, patents, charters and articles. Institutionally, learning, skill sharing, meeting, understanding, business skills, and belief systems controlled by an authority figure are good examples of tacit knowledge. Nonaka and Takeuchi (1995) stated which is explicit and other one is tacit knowledge. Explicit knowledge is written form and can be expressed easily where tacit is the knowledge which is poses experience and poses in the learner's brain. Even those who are acquainted may not be able to fully grasp the structure of knowledge. They developed two types of knowledge: tacit knowledge (intangible knowledge) and explicit knowledge (intangible form). Rehman, Llyas and Asghar (2015) examined tacit knowledge based on personal experiences, practices, and discoveries by having specific interactive knowledge. KM can solve problems, which enables companies and their employees to share their ideas and personal experiences to help their institutions to solve their problems. Facts have shown that tacit knowledge is very necessary for institutions. Wilde (2009) pointed out that tacit knowledge is useful because it is not made available to recipients in writing and therefore allows different departments and individuals to make changes according to their needs and ideas. The introduction of innovations always involves financial and administrative risks, which means that institutions are likely to speculate on innovation if the level of explicit knowledge is expanded. Chou and Liu (2013) stated that tacit knowledge is the personal experience of individuals. Unlike explicit knowledge, it cannot be institutionalized or disseminated, and formalized in a specific environment. It can be represented or communicated verbally to others. The conversion of tacit knowledge into explicit knowledge with a systematic process improves the innovation outcomes in the institutions.

KM Source (internal and external) into the degree of knowledge base and innovative outcomes

Alvarez and Eskey (2015) describe two main methods of innovation: The first method considers the internal capabilities of the company as the main driver for development. It is advocated that if the company has strong internal resources or accurate skills, it can better access them on time at a lower cost. The second method considers that innovation is driven by the institution's external resources. External resources are also important because every organization has different types of knowledge, and institutions can use this knowledge to get benefits and to achieve its goal.

Diaz and Perez (2014) finds that organization having greater number of internal knowledge sources even can further enhance absorption, considering the ultimate goal of improving organizational development. In either case, an abnormal state of reliance on internal knowledge will lead to newly approved schedules, which may negatively affect the institution's ability to improve. Because of the combination of an absorption limit and unresponsiveness, the relationship between mechanical ability and progression can be even more confusing.

Knowledge management has proven to be a guide to innovation outcomes as it provides structured data and becomes an important part of the innovation process. In the study "The Practice of Innovation Knowledge and Performance Management in Finland" the author concludes that companies can support innovation performance through knowledge management and strategic skills, knowledge-based compensation practices, and information technology practices. Research by Diaz and Perez (2013) shows that acquiring knowledge from internal or external sources can bring innovation within a company through the use of this external knowledge. Then the inner knowledge will merge with the newly chosen outer knowledge. From different dimensions, people can understand the importance of external sources of knowledge that is going to give company's competitiveness and also give realistic picture that where they stand. Kalogeropoulos et al. (2004) studied that innovation can be a process that helps companies overcome current problems and prepare for future problems. It is a process for companies

to share and solve problems. The knowledge can be obtained from outside the institution, and by adding institutions tacit knowledge which can help to understand the idea concept, system that are been placed, and the two will be carried out together to develop new products and services for improvement.

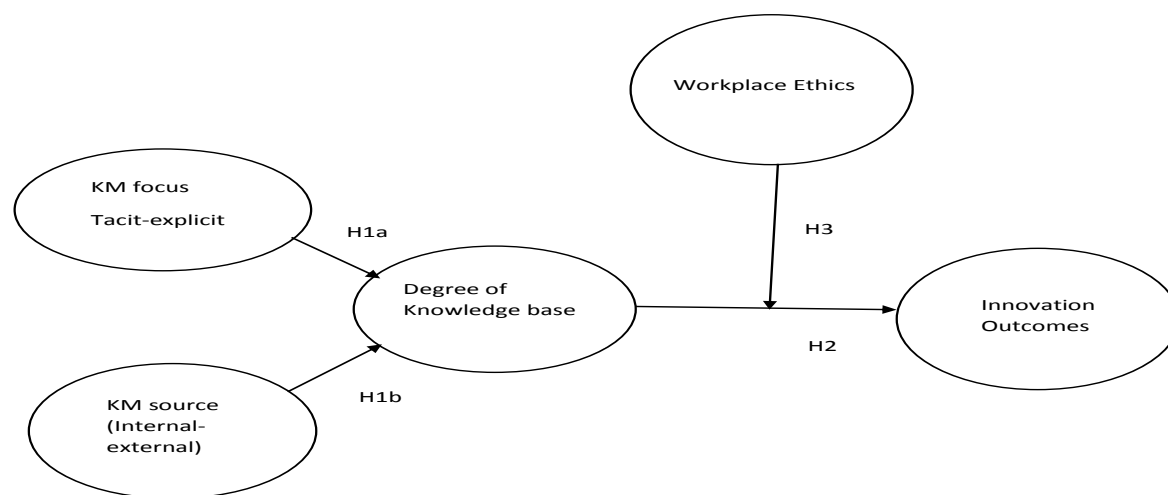
Falkenberg, Woiceshyn, and Karagianis (2003) investigated whether organizations benefit from acquiring and creating internal knowledge with the help of workers or through knowledge that occurs within the company. This occurs when members have been able to generate new knowledge through their experience and practice and there has been an internal exchange of knowledge, for example through their research and development programs. External knowledge can also generate organizational improvements, or knowledge will emerge when internal sources obtain new knowledge from external sources. The obtained knowledge is then applied within the organization to improve, develop and reform it.

Workplace ethics plays moderating role between degree on the knowledge base and innovation outcomes

Limited knowledge is available on workplace ethics and innovation in institutions but work is available related to the values such as integrity, responsibility, accountability, and reliability which play an important role in global skills theory. The authors of workplace innovation in their paper analyze employee's tendency to innovate in the professional fields, by focusing on the specific skills, for those who play a vital role in integrating innovation in the workplace facilities, technology, and knowledge. The analysis draws on the corporate and management literature for innovation, creative behavior, and skills, to better understand the relationship between the skill development process for knowledge management and innovative behavior.

Research model and hypotheses

In the literature review, we proposed that degree of knowledge base would be enhanced through Knowledge focus (Internal and external) and to improve the quality of knowledge sources that precede the knowledge base, and the knowledge base is linked to the results of the innovation. The main theme in the proposed model is the strength of the knowledge base and subsequently, it will be enhanced by adding workplace ethics which lead to innovation in educational institutions.



Hypotheses

The following hypotheses have been derived for this study, which has been investigated in Higher education institutions of Pakistan:

- H₁:** Increase in KM focus could enhance the innovative outcome.
- H₂:** Effective KM (Internal and External) sources would lead to innovative outcomes.
- H₃:** Fostering the KM focus would add to the degree of the knowledge base.
- H₄:** Effective KM (Internal and external) sources could enhance the degree of the knowledge base.
- H₅:** Efficient degree of knowledge base will strengthen the innovative outcomes.
- H₆:** Work Ethics would enhance innovative outcomes through the degree of the knowledge base.
- H₇:** Degree of knowledge base plays a mediating role between KM sources and Innovation outcomes.
- H₈:** Degree of knowledge base plays a mediating role between KM focus and innovation outcomes.

Research Instrument

For innovation, the instrument (Ashraf , Numair , 2012) and developed by (Ashraf Numair, 2012), for tacit and explicit knowledge by wang and wang (2012), Internal knowledge and external knowledge by (NaiefAzyabi, Julie Fisher, Kerry Tanner, ShijiaGao, 2012), IWE is measured by 17 items that were given by (Ali, 1988). The

instrument is measured on a 5 point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). Innovation consist of (4 items), knowledge sharing (5 items), explicit knowledge (6 items), tacit knowledge (7 items), external knowledge (4 items), internal knowledge (3 items),. The total numbers of items in the instrument were 40. The instrument had also the demographics of respondents i.e. age, marital status, and level of education.

Data Collection

Many researchers have studied KM impact on innovation like Akram , Nawaz , Ghauri and Siddique (2011) studied about knowledge creation and its effect on innovation . In addition to this they also investigate low ,mediam and high model which tie togather for K creation.Eskandani et. al (2015) KM create understanding for understaings for system and simply the process. Knowledge exchange has been enabled for improvement and current advances . It develops builds creative execution by cultivating new ways of thinking and new skills. Consistent with the literature to date, the results show that although knowledge management practices are indispensable even for innovation purposes, the existence of knowledge base management promotes the development and use of knowledge exploration and practice.

It is widely believed that the explicit and implicit parts of institutional knowledge play an important role in innovation. With the advent of knowledge management as a new discipline, it has become inevitable to combine knowledge management with innovation.

Data Analysis and Results

Two important tools used in the research for the data analysis were SPSS and AMOS. SPSS is regarded as a ‘Statistical package normally used for social sciences researches’ while AMOS is known as “analysis of moment structure” is used for Model fit statistics. In the research, SPSS is utilized for composing data sheets by extracting information from gathered data of the target population under study. Furthermore, for the acceptance of the hypothesis at a significant level of 0.05 direct and indirect effects have been utilized. Whereas, structural equation modeling which is regarded as one of the most reliable methods for path analysis is also used. The result indicates that Knowledge management has a positive impact on competitive advantage while Islamic work ethics have a moderating impact. This concerns that the overall model was fit and all values lie within the acceptance range. Thus, hypotheses including H1, H2, H3, H4, and H5 were found supported.

Results and Discussion

The research validates hypothesis one i.e. H1 that knowledge management is positively associated with innovative outcomes. Moreover, the correlation coefficient which is $R=0.49$ less than $p\text{-value} < 0.05$ further confirmed that there is a significant positive relationship between these two variables. The beta coefficient value (PI) is 0.38 at $p\text{-value} < 0.05$ which declares that knowledge management is considered as a major component for attaining innovation and competitive advantage and it has an important part in the beta coefficient. This illustrates that to foster the growth of the Institution, there should be an emphasis on the Knowledge Management system. It can be concluded that the findings of this research are justified and validated as have congrance with previous studies .

Table 1: Summary of Hypotheses results H1-H5

Variables	Beta Value (B)	Criticle value	Value of P	Decision / Remarks
β_1 (INO←KMF)	0.69	12.31	0.00	Supported
β_2 (INO← KMS)	0.71	17.21	0.00	Supported
β_3 (DKB←KMF)	0.55	12.31	0.00	Supported
β_4 (DKB← KMS)	0.76	19.21	0.00	Supported
β_5 (INO← DKB)	0.74	14.21	0.00	Supported

Note KA= Knowledge Management, INNO = Innovation, KMF = Knowledge Management focus, KMS= Knowledge Management Sources

Moderation Analysis

Similarly, Third Hypothesis H3 indicates that Islamic Work Ethics significantly validates that the relationship between innovation and Knowledge Management is found supported. It shows that Knowledge Management with product Innovation is demonstrated with a 0.038 beta coefficient value at a significance level of 0.05. Moreover conditional indirect impact at each level is found substantial. The relationship of Knowledge Management with the Islamic Work Ethic (moderator) regressed considerably with innovation indicated by the beta coefficient of value= 0.141 at 0.05 significance level. The findings validate the H3 hypothesis that IWE moderates the linkage between INNO and KM, which verifies the H3 hypothesis.

Table 2: Coditional indirect effect of work ethics on Degree of Knowledge base and Innovative outcomes

Antecedent	Consequent					
	<i>M(DKB)</i>			<i>INNO (Rep. Int.)</i>		
	<i>Coeff.</i>	<i>SE</i>	<i>P</i>	<i>Coeff.</i>	<i>SE</i>	<i>P</i>
<i>M(DKB)</i>	-	-	-	b_1	0.204	0.247 < 0.01
<i>V(IWE)</i>				b_2	0.507	0.106 <0.03
<i>M X V</i>	---	---	--	b_3	0.391	0.219 0.00
Constant	i_1	3.282	0.231	< .002	i_2	0.231 0.121 <.00

KM = Knowledge Management (Independent Variable), CA = Competitive advantage (Dependent Variable), IWE= Islamic Work Ethics (Moderator)

Research and approach of testing interaction between variables, Degree Knowledge Base which was treated as predictor against innovation which is the dependent variable in the presence of Islamic Work Ethics which is moderator⁶. Consequently, following the guidelines of the research conducted by Aiken and West in 1991 the responses were organized and stored in ascending order and divided into two major groups on values of the moderator. A Scatter plot diagram was drawn and slopes were evaluated for low and high-level values of the moderator i.e. Islamic Work Ethic. Along with this, the interactional-based regression is used to explain statistical significance which is indicated in Table -2. Through this analysis, it is identified that IDV DKB was strongly related with Innovative outcomes which are dependent variables at higher levels of moderator which is Islamic Work Ethics. Thus, results showed that regression = 0.807 as compared to the medium regression=0.441 and low levels regression=0.209 this result implies that in the presence of higher levels of moderator Islamic Work Ethics the effect of Degree of Knowledge base on Innovation increases.

Mediation analysis

The beta value for the standardized estimates of the relationship of KMS-DKB-INO is 0.842, p-value is 0.00 represents the significant mediation of KMS and INO among IV and DV. The beta value of standardized assessments of the relationship of KMF-DKB-INO is 0.722, the p-value is 0.01 represent the significant double mediation of KMF and INO among IV and DV.

Table 3: Mediation results table – H_7 and H_8 .

Variables Connections	Total effect	Direct effect	Indirect effect	Remarks	Level of mediation
$B_7(INO \leftarrow DKB \leftarrow KMS)$	$\beta = .842$ $p = .00$	$\beta = .651$ $p = .015$	$\beta = .491$ $p = .004$	Significant	Partial
$\beta(INO \leftarrow DKB \leftarrow KMF)$	$\beta = .722$ $p = .01$	$\beta = .421$ $p = .012$	$\beta = .601$ $p = .010$	Significant	Partial

Managerial Implications and Recommendations

The study proposes numerous implications for higher educational institutions of Pakistan related to KM and digital learning. The empirical evidence suggests that employees are more likely to participate for enhancing innovation in their organizations. Furthermore, institutions need to make an effort to develop capacities related to Knowledge Management in the Institutions which ultimately broaden the degree of the knowledge base for digital learning. Sources of Knowledge would also need to reassess for digital learning because traditional sources may not be as useful as modern resources. Institutions can also train their managers, supervisors and employees should focus on KM practices to foster innovative outcomes in the digital learning system. For innovative enrichment, they need to introduce strategies that should be based on knowledge sources and knowledge focus. Work Ethics should be introduced and enhance in the Institution for the development of innovation, which will be the major source for competitive advantage.

Limitations and Future Direction of the Research

In this study, the significance of Knowledge Management for an Institution has been discussed. However, certain arguments are related to Knowledge Management and are required to be addressed to attain insight regarding the concept of Knowledge Management. Furthermore, the need of the hour is to identify how adequately is Knowledge Management phenomena are adopted and their impact on firms' innovativeness. In this regard, research studies are conducted in various contexts which yielded varied outcomes. It demands future research studies in various other settings to obtain more authenticated results. The present research study has

been conducted in the higher education sector of Pakistan. There are very few research studies conducted before in this sector in Pakistan according to evidence presented by researchers. Thus, the present study is only focused on higher education institutions of Pakistan, however, in the future data may be gathered from other sectors as well at the same time variables like knowledge capacity and psychological capital may be included to expand the research areas.

Conclusion

This research study offers a theoretical framework and empirical assessment of the multidimensional relationship among Innovativeness, knowledge sources, focus, degree of knowledge base, and Work Ethics. The findings indicate that there is a relationship between knowledge sources, focus, degree of knowledge base, and innovative outcomes. This research highlights the importance of knowledge as an innovative factor which cannot be overemphasized in addition to the professional development of employees and resources. It indicates that to foster innovation in higher education institutions, there is a dire need to focus on knowledge sources to enhance the degree of knowledge. Institutions need to get optimum benefit by managing knowledge resources in an appropriate way keeping in view the existing professional development of employees to cope with the emergent digital trends in the present era. For this purpose, institutions require knowledge utilization in an apt and proper way as it is the only means to attain considerable help in this fast-growing business world.

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