

Relationship between Intellectual Capital and Organizational Performance: A case Study of Public Sector Universities in Southern Punjab-Pakistan

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Abstract

During the last decade the growing interest in intellectual capital has been shifted from business organizations to higher educational institutions because major functions of higher educational institutions particularly Universities is to create and disseminate knowledge acquired through education and research. Now educational institutions are regarded as center of innovations and produce of innovative human capital.

The main objective of this study is to analyze the concept of intellectual capital, its importance for higher educational institutions and its impact on their working environment and performance. For this purpose the author has selected two Universities, namely: Bahauddin Zakariya University Multan and Islamia University Multan and has taken a sample of 200 employees of these Universities: 150 academic and 50 non-academic. The data was collected through a structured questionnaire by conducting face-to-face interview. Three estimation methods were used to analyze the data. Five point likert scale was used to record the view of respondents about the importance of intellectual capital and its management by these two selected Universities. Regression method was used to measure the impact of intellectual capital (independent) variables on the performance (dependent variables) of these Universities. Scorecard and Ratio Analysis was used to compare the output level of intellectual capital and their relative performance.

Our empirical results are robust and show that intellectual capital and organizational performance has had a significant correlation and Bahauddin Zakariya University Multan outperformed Islamia University of Bahawalpur in better output of intellectual capital, its management, and overall performance. The evidence shows that Bahauddin Zakariya University Multan has greater intellectual capital than Islamia University of Bahawalpur. As regard to the components of intellectual capital, human capital ranked first in its impact on performance while structural capital and rational capital has second and third rank. In other words, human capital has greater contribution in creation of intellectual capital and its influence on the performance of these two Universities, out study concludes.

Keywords: Intellectual capital, Human capital, Structural capital, Relational capital, University, Research performance.

1. Introduction

1.1 What is intellectual capital?

It is generally assumed that in knowledge-based economy, the wealth and the growth is “driven primarily by intellectual assets” (Lev, B. 2001). In the last decade, the importance of the intangibles and intellectual capital have been taken very serious both in academics as well as in government, different enterprises, public departments, investors and other relevant areas.

In today’s world, the economies are being transformed from manufacturing to knowledge intensive economy, manufacturing work is shifting towards knowledge work. It is the era of intangible assets and the intellectual capital. In the past, the value of the organization was measured by its tangible assets, but it was a limited approach through which under estimation of the value of the organizations (especially in service organizations) was seen (Brown, M.G. 1999).

Every organization has possessed two types of assets these are tangible and intangible. There is a clear distinction between tangible and intangible assets. Despite of the fact that intangible assets create large volume in market value for the firm, but it is not recorded in the balance sheet. Now a days, 20% of the business resources are comprise of tangible assets and rest of the 80% comprise of intangible values (Roos *et al.* 2001). The success of the organization is promised with the management of these assets.

1.2. Definition of intellectual capital

According to the scholars there is no hard and fast definition of Intellectual capital. The reason is that there are different methods to calculate the intellectual capital. According to M. Alipour (2012), Intellectual capital is defined as “a group of knowledge assets that are owned and controlled by an organization that create value.” It is

situated in the minds of organization's employees, in their structure and their Relations (R. Ngah and A. R. Ibrahim; 2009).

The terms such as; knowledge asset, knowledge economy, intellectual property, intellectual asset/capital, and intangible assets are often used as synonyms to each other. In 1962 first effort relating to intellectual capital was taken by Fritz Machlup, but historically the term "intellectual capital" was first time named by John Kenneth Galbray in 1969 (Diez, 2010). The new development relating to this appears in 1990s (Marr, B. and Roos, G. 2005). Until yet there is no single universal definition of intellectual capital which is accepted by every scholar. Stewart (1997) and Yi, (2010) contend that components of this useful knowledge are organizational processes and procedures, technologies possessed, exclusive privileges, skills of the employees and organizational customers, suppliers and stakeholders.

1.3 Universities/HEI's are centers of Innovations

There is a high degree of consensus that Universities and other Higher Education Institutions are social institutions and have an infinite life. The world oldest universities are more or less 800 years old. Most of these universities were established in Europe like Oxford in 1187 and the venerable Bologna University was formed in 1088. Those days' activities and role of these universities were quite different from today's universities. Their sole functions was to transfer store knowledge through teaching because there was no institutional arrangements for research. Mostly research was conducted at individual level.

The founder of Berlin University, which was founded in 1809 in Germany, Wilhelm von Humbolt developed a model in which the function of University was proposed to create and disseminate new knowledge. He termed University as a knowledge-intensive organization. After a competition was started among Universities in creation, sharing and transmitting of knowledge through formal research institutions.

1.4 Function of Universities

Ramirez et al. (2007) argued that intellectual capital management approaches are very important for universities because university's main goals are generation of new knowledge and its dispersion. Due to this fact their main investments are in research, human and structural resources.

According to Metaxiotis and Psarros, (2003), there are three main functions of universities which are stated as under:-

- Teaching – to develop scholars for high level jobs, provides necessary knowledge for their personality growth and successful life.
- Research – to extend the theoretical knowledge and creativity, and build capacity among students to solve the practical problems.
- Services – to serve in communities at different level positions in the organizations and to take part in different activities in local, national, and international communities.

1.5 Development of Universities in Pakistan

Higher educational institutions/Universities are critical institutions that play a crucial role in the development of any nation, through their knowledge based activities especially in developing counties like Pakistan.

At the time of partition with India, the Pakistan had only one university named; The University of the Punjab. After that, in next two decades many public sector higher education institutions were established to help the government in order to accommodate graduates and fill the education gap. In 1970s, all of Pakistan's educational institutions were nationalized. At that time, only 25 % graduates were accommodated in higher education institutions, while whole of the Pakistani education system was unable to facilitate the remaining pass out graduates. In 1979, a government commission reviewed the nationalization decision and came to the point that there were a poor participation at all levels of education and public sector is the sole provider of higher education in the country. In the early 1980s, private sector institutes were allowed to participate in higher education system with government. Until 1990s, only two private universities were recognized in Pakistan that are; Aga Khan University and Lahore University of Management Sciences. Aga Khan University was established in 1983 and later on in 1985 Lahore University of Management Sciences was established. In 1997 there were only ten private universities in Pakistan and this number had doubled in 2001-2002. In 2003-2004 this figure was 53 and in 2004-2005 Pakistan had 107 public and private degree awarding institutions. In order to full fill the increasing demand and to fill the education gap, the government has made it relatively easy for the private sector to establish higher education institutions. Due to this Higher education institutions (HEI's) have expanded throughout the country, there were 127 HEI's in 2009. In the year 2010 this figure was 132, in year 2011 this figure increased to 138. In 2012 Pakistan had a total of 146 Higher education institutions.

The primary regulator of higher education institutions in Pakistan is the Higher Education Commission (HEC), formerly named the University Grant Commission. The basic purpose of this commission is to facilitate the educational system, to up gradation of the universities to the world best level institutions and to promote

research culture in the higher education institutions in Pakistan.

1.6 Research Problem

In this study main question is; “Intellectual capital and research performance of the universities in Pakistan”. In order to elaborate our main research problem we have transformed it into the following two research questions with respect to intellectual capital, its components and universities research performance are raised:

1. Is there a significant impact of intellectual capital and its components on research performance of the university?
2. Is Bahauddin Zakariya University or Islamia University of Bahawalpur have greater intellectual capital?

1.7 Objectives of the Study

The core objectives of the present study are to:

- Examine the direct impact of intellectual capital and its components on the research performance of universities.
- Examine the intellectual capital of Bahauddin Zakariya University, Multan and The Islamia University, Bahawalpur.

1.8 Importance of the Study

In developing countries like Pakistan, intellectual capital management and its reporting is considered a crucial factor for industries as well as for universities. It is only due to the fact that when the industry of a country grows it will definitely affect the economy of the country positively. This research helps in providing assistance to the universities in the process of developing their ability to identify and manage their intellectual capital.

2 LITERATURE REVIEW

2.1 Intellectual Capital

Stewart (1997) discussed the components of intellectual capital such as organizational processes and procedures, technologies possessed, exclusive privileges, skills of the employees and organizational customers, suppliers and stakeholders. He stated that intellectual capital consists of all organizational processes and intangible assets that are not shown in financial statements.

Roos et.al. (1997) describes that “Intellectual Capital includes all the processes and the assets which are not normally shown on the balance sheet and all the intangible assets (trademarks, patents, and brands) which modern accounting methods consider. It includes the sum of the knowledge of its members and the practical translation of his/her knowledge”.

Bontis, N. (2001) reviewed different models used by different researchers to measure intellectual capital. The models are: Skandia navigator, Economic value added, Market value added, IC-index, Technology Broker, Citation-weighted Patents and Intangible Asset Monitor. Some of these models measure the intellectual capital in financial terms and attempt to record it in the Balance sheet. The author summarizes these models and presented their strengths and weaknesses along with their practical application in different organization. However, this effort was fail to present a comprehensive process and standardized measuring model for intellectual capital.

Robinson, G. & Kleiner, B. H. (1996) analyzed measurement techniques of intellectual capital such as value chain and the financial cash flow valuation models. The authors also suggested the key components such as know-how skills and information systems of intellectual capital, which must be examine while analyzing the impact of intellectual capital on the value creation.

Stewart, T. A. (1999) in his book “Intellectual capital: The new wealth of organizations” provides a groundbreaking visionary evolution of intellectual capital and its powerful impact on the firms. The author describes the importance of intellectual capital and its main practical contribution in uplifting the value of the firm and its stakeholders. He also identify where intellectual capital is embedded. In the early chapters the author realized that human capital is the key driver of intellectual capital. It plays a key role in yielding innovation and growth. The second key driver is structural capital. This capital supports the human capital and provides an infrastructure to hold and make it stronger. It includes the elements of management strategy and philosophy, organizational culture, operational process, procedures and information system. In the end of this book the author discussed the third component customer/ relational capital. The author stated that customer capital refers to internal and external relationship of the organization with its stakeholders.

Bartholomew (2008) stated that intellectual capital is an asset which related to the employees abilities, company’s internal structure and its external relation with customers. Employees’ abilities include their skills, experience and education; while company’s internal structure means its administrative policies, procedures and systems.

According to Gavious & Russ (2009) Intellectual capital is "the enhanced value of a firm attributable to

assets, generally of an intangible nature, resulting from the companies' organizational function, processes and information technology networks, the competency and efficiency of its employees and its relationship with its customers." Lu et al. (2010) stated business firms could obtain a competitive advantage in the market place, including knowledge, information, intellectual property rights, and experience through intellectual capital.

2.2 Distinction of this Study

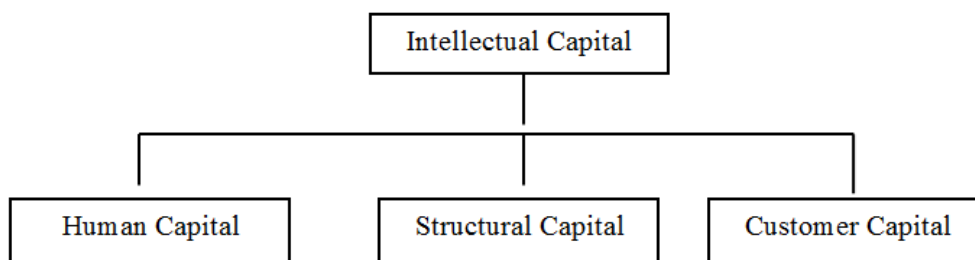
A number of studies available on intellectual capital in the last 50 years have focused on its reporting, measuring and management. Different studies are also conducted on intellectual capital and its impact on organizational performance in various industrial sectors. However, empirical evidence regarding intellectual capital effect on research performance of universities is scarce in the international literature. As no research was conducted specifically on intellectual capital in higher educational institutions, this study is a pioneering effort to examine the intellectual capital in Pakistani universities and its impact on research performance of the universities.

3. Conceptual Framework

3.1 Components of Intellectual Capital

According to Tai & Chen (2009) intellectual capital can be categorized as process capital, innovation, research, and development capital. Sveiby (1997) classifies it as internal structure, external structure and human structures. Marr et al. (2004) classifies intellectual capital as a combination of human resources, market assets, infrastructure and intellectual property. Stewart (1997) has classified intellectual capital as the combination of human capital, structural capital and relational (customer) capital.

Figure 1: Determinants of IC (Steward, 1997)



By review the literature of Edvinson & Malon (1997), Roos et al (1997), Bontis (1998), intellectual capital includes three basic components: Human Capital, Structural Capital and Customer/Relational Capital. Now we explain the importance of these three components of capital in the following:

3.1.1. Human Capital

Hudson (1993) describes human capital as a genetic inheritance of an employee, it also includes his learning, experience, and work behavior. Bontis (1998) defines human capital as a capability of an employee to find the solutions of the problems. The main problem with this capital is the threat of loss in case the employees leave the organization. Bontis, N (2001) describes that human capital is much more important to the organization because it brings innovation and becomes the main source of sustainable competitive advantage. Despite its importance, there is no universal definition for it. Kim et al. (2010) stated that every organization generate its economic value by utilizing capabilities, skills and education of their employees.

3.1.2 Relational Capital

Relational capital includes the relations that are owned and developed by the organization through its business; it also includes the knowledge in the marketing channels. Kaplan and Norton (1996) argued that the relational capital emphasized the relationships among employees and customer. It shows the loyalty and satisfaction of the customer and employees in connection with organizational performance.

Edvinson and Malone (1997) described that relational capital is the part of structural capital. However, Bozbura (2004) argued that structural capital and relational capital are entirely different to each other. Chen et al. (2005) defines relational capital as the main component of intellectual capital which help organization in creating market value. They also stated that relational capital has high significant effect on organizational performance. Chang & Tseng (2005) argued that relational capital provides a foundation for value creation through internal and external relations which are developed by the organization with their stakeholders.

3.1.3. Structural Capital

According to Edvinson and Sullivan (1996) structural capital is one of the main components of intellectual capital which includes infrastructures of a business unit and provides a base for growth. Cohen and Kaimenakis (2007) argue that structural capital as a whole owned to the firm and stay in it. This can be reproduced and shared with people. Structural capital provides better working conditions, increase knowledge and sharing, it also helpful in increasing productivity of the organization and people. Stewart (1999) describes structural capital as non-human knowledge which includes policies, procedures, general system and structures in the organization.

According to him all these things have greater value than its material value. Roos et al. (1997) defines structural capital as “knowledge what stays in the firm when employees leave the work place”. Structural capital includes the organizational procedures, values, and future development policies. According to Ramezan (2011) structural capital refers to embedded knowledge in the firm and supportive to the human capital. It includes formal and informal structure of the organization, its culture and learning process, structural capital support and enhances the employees’ job performance.

3.2 Research Performance

M. Alipour, (2012) stated that the most important outputs of universities are knowledge, research contributions, publications, educated students, and internal and external relations with stakeholders. On the other hand, the most valuable resources of these universities are their researchers, faculty members, non-teaching staff, administration, infrastructure, database, policies, procedures and networking with their stakeholders. There is high degree of consensus among the researchers that simplest way of measuring research performance is on the bases of No. of publications, citations and sometimes some other assessment tools. According to Verry and Layard (1975), the easiest way to determine the research output is compiling of weighted average publications of various types of research by the university. Johnes and Taylor (1990) argue that research performance can be measured by traditional measure of publications and citation analysis.

3.3 Impact of Intellectual Capital on organizational Performance

The above studies confirm that intellectual capital has a significant and substantial impact on organizational performance.

Min Lu, W. (2012) examined the role of intellectual capital in HEIs/ Universities. He studied intellectual capital and its components in teaching and research efficiency. The results confirm that the Higher Education Institutions are more efficient in cost handling in teaching and better research efficient than any other organization. The results of regression analysis indicate that intellectual capital can positively influence the teaching efficiency and research activities.

Sadaghiani, J., and Jamali, H. (2012) examined the impact of intellectual capital and its components on performance in accounting parts of hospitals. The results show a positive relationship between them. The regression analysis indicates that a unit increase in intellectual capital can increase 1.62 units increase in the performance of the medical university. Similarly a unit increase in human capital, relational capital, and structural capital will affect an increase of 1.278, 1.21, and 1.415 units increase in financial performance, respectively.

Iswatia and Anshoria, (2007) studied the influence of intellectual capital on financial performance of the insurance companies. The research was carried out by using the secondary data from Indonesia Capital Market Directory 2005, only listed insurance companies in Jakarta Stock Exchange was taken. It was found that intellectual capital has influence to financial performance in insurance companies.

4 RESEARCH METHODOLOGY

4.1 Nature of study

The descriptive research is more appropriate when a specific area of research is under study and there is need to describe and explain it more to clarify its relations and properties. In descriptive research, questions are defined, people are surveyed and the methods of data analysis are discussed before the collection of data. The aim of this research is to examine the impact of intellectual capital and its components on research performance of the universities. Thus, this research work is based on Descriptive Research.

4.2 Research Approach

There are two types of research approaches deductive and inductive. If hypothesis or research questions are formulated and strategy for the study is designed to test these hypotheses or to answer the research questions, then it can be said that this research approach is deductive. Whereas in the inductive research approach we collect the required data and developed the theory for data analysis and results. As for as this study is concerned, research questions are constructed, strategies are properly designed to investigate and answer the questions accordingly, thus the research approach for this study is deductive.

4.3 Study Design

This is a case study of two Universities located in Southern Punjab, Pakistan. In this study we have explored the knowledge management by these Universities and its impact on their performance.

4.3.1. Population

Due to the time and cost limitation, the population of this study was narrowed to the Universities in the Southern Punjab, Pakistan. To accomplish the research objectives the population of research was consisting of those

Universities of Southern Punjab which are in public sector and are recognized by Higher Education Commission of Pakistan.

4.3.2. Sampling

We selected, The Islamia University, Bahawalpur and Bahauddin Zakariya University, Multan. As a sample of this study. These Universities are situated in Southern Punjab, which is a Saraiki belt comprising three Divisions: Multan, Bahawalpur and Dera Ghazi Khan. These three Divisions comprising of 11 districts, having total area of 99572km² which makes up 48.5% of the total area of Punjab Province. This shows that area wise the southern Punjab region is almost the half of the Punjab province.

4.3.3 Data and type

We used secondary data in this study which was collected from different sources such as official websites of the Universities, Higher Education Commission of Pakistan, annual reports of the Universities and Higher Education Commission of Pakistan, relevant books and research Journals and Prospectus of Universities.

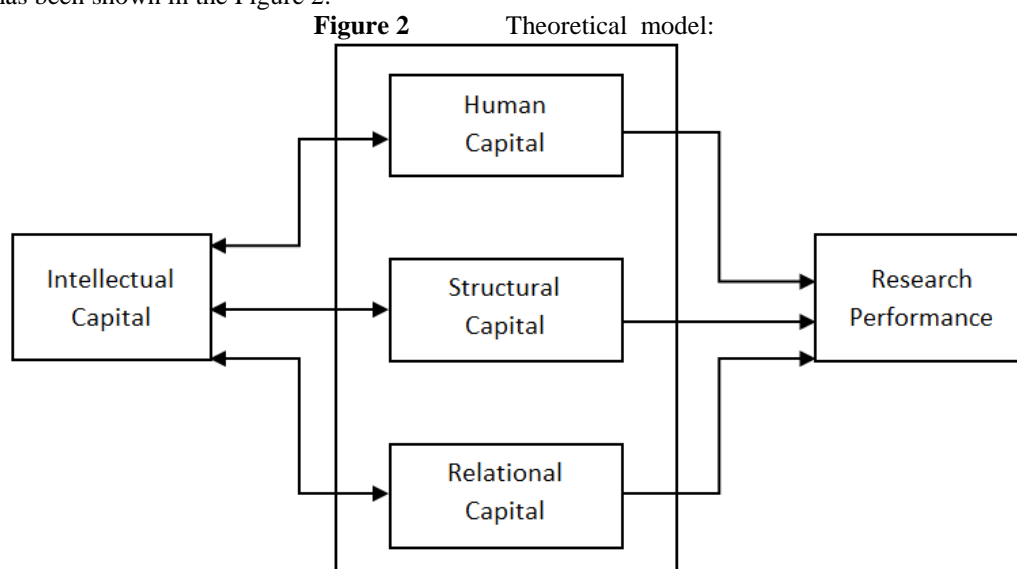
4.3.4 Estimation techniques

For estimation and data analysis the following techniques have been used in this research.

- Descriptive analysis
- Ratio Analysis
- Scoring card Analysis
- Pearson Correlation Analysis

4.3.5 Proposed Model

For this research, on the bases of these selected indicators, the following theoretical model is developed to assess the effects of intellectual capital management on research performance of universities. This model has been shown in the Figure 2.



5 DATA ANALYSIS AND RESULTS

12 indicators have been shown in the Table 1 to compare the research performance of Bahauddin Zakariya University Multan and Islamia University of Bahawalpur.

Table 1 Intellectual Capital & Research Performance indicators of BZU and IUB

<i>Intellectual Capital / Performance</i>	<i>The Islamia University of Bahawalpur</i>	<i>Bahauddin Zakariya University, Multan</i>
	Mean	Mean
Student per Permanent Teacher*	26	28
Student per Visiting Teacher*	28	17
Percentage of Ph D faculty to total faculty*	23.5%	33.5%
Ratio of Admission to Applications*	62.1%	45.1%
Increase in no. of Admission as per previous year*	13055	14639
Student per Computer**	5	5
Library Books per Student**	16	17
PERN kb Per Computer**	6.946	7.806
Students per Lab**	93	98
Research Paper to Research Scholar***	1	1
Ratio of M Phil passed out to total students admitted***	0.51%	1%
Ratio of Ph D passed out students to total students admitted***	0.11%	0.12%

*Selected indicators for Human capital

**Selected indicators for Structural Capital

***Selected indicators for Relational Capital

****Research Performance

Table 1 highlights the different Ratios relating to the intellectual capital and research performance of the IUB and BZU, for the period 2008-2012. The comparison of the IUB and BZU in respect of Intellectual capital, its components and Research Performance of the Universities highlight the fact which University has outperformed in the study period. This also shows the impact of intellectual capital and its components on research performance of two universities. The average ratios which described the Human capital for the IUB were: No. of students per full time teacher 26, Students per visiting teacher 28, Percentage of Ph D faculty to total faculty 23.5%, Ratio of admission to total applications 62.1%. Total no. of admission in Islamia University was increased by 13055 as compared to previous year. The data of ratio analysis for BZU show No. of students per full time teacher 28, Students per visiting teacher 17, Percentage of Ph D faculty to total faculty 33.5%, Ratio of admission to total applicants 45.1%, Total no. of admission in BZU were increased by 14639 as compared to previous year.

The data also show that the average ratios, which highlights and explained the Structural capital of the IUB, were: Students per computer 5, Library books per students 16, PERN Kb per computer 6.946, Students per Lab 93, while for BZU these average were: Students per computer 5, Library books per students 17, PERN Kb per computer 7.806, Students per Lab 98.

Last three ratios of this Table illustrated Research performance of the Universities. Average ratios relating to these for the IUB were: No. of papers per Research Scholar 1, Ratio of M Phil passed out to total admitted students was 0.51%, Ratio of Ph D passed out students to total number of admitted students 0.11%, and for BZU these ratios were: No. of papers per Research Scholar 1, Ratio of M Phil passed out students to total number of admitted students was 1%, Ratio of Ph D to passed out students to total number of admitted students was 0.12%. Thus, most of the indicators of Bahauddin Zakariya University Multan is better than Islamia University of Bahawalpur.

Scoring Card Analysis

We have outlined scoring card results in the following table.

Table 2 Scorecard for Intellectual capital and Research performance BZU and IUB

	<i>IUB</i>				<i>BZU</i>			
	8-9	9-10	10-11	11-12	8-9	9-10	10-11	11-12
HC	0	0	1	1	5	5	4	4
SC	0	0	0	0	4	4	4	4
RC	4	0	1	0	1	5	4	5
IC	4	0	2	1	10	14	12	13
RP	0	0	1	0	4	4	3	4

HC=Human Capital, SC = Structural Capital, RC = Relational Capital,
 IC = Intellectual Capital, RP = Research Performance

In the table 2 a binary state table of comparison among both universities is generated to equate the diverse quantitative data in form of true/false i.e. 1/0 for higher / lower numbers. This scoring card shows the scores of human capital, structural capital, relational capital and research performance gained by the both universities. These scores show the higher scores of the BZU as compared to the IUB. It is depicted from the above tables that the total score taken by the IUB for Intellectual capital in all components (Human, Structural and relational capital) were 4, 0, 2 and 1 out of 14, while for the BZU these scores were 10, 14, 12 and 13 in the sessions 2008-9 to 2011-12. These scores show the higher scores of the BZU as compared to the IUB.

In the end these tables shows the selected indicators for Research performance which includes: No. of papers published by the university, No. of W, X, Y, Z Journals published by the university, Total M Phil output and Total PhD output, these indicators of research performance gained the scores of 0, 0, 1 and 0 for IUB out of 5 and for BZU they gained the scores of 4, 4, 3 and 4 in the sessions 2008-9 to 2011-12.

Pearson Correlation

Table 3 Relationship between HC, SC, RC, IC and RP

Correlation		HC	SC	RC	IC	RP	
IC	Pearson Correlation	.923**	.963**	.789*	1	.941**	
	Sig. (2-tailed)	.001	.000	.020		.000	
	N	8	8	8	8	8	
	Bias	.004	.004 ^e	-.023 ^f	0	.003 ^f	
	Std. Error	.073	.019 ^e	.200 ^f	0	.048 ^f	
	Bootstrap ^d	Lower	.828	.928 ^e	.273 ^f	1	.861 ^f
		Upper	.994	.995 ^e	.996 ^f	1	.994 ^f
RP	Pearson Correlation	.975**	.971**	.572	.941**	1	
	Sig. (2-tailed)	.000	.000	.139	.000		
	N	8	8	8	8	8	
	Bias	.000 ^f	.002 ^e	-.004 ^h	.003 ^f	0 ^f	
	Std. Error	.027 ^f	.018 ^e	.311 ^h	.048 ^f	0 ^f	
	Bootstrap ^d	Lower	.943 ^f	.933 ^e	-.185 ^h	.861 ^f	1 ^f
		Upper	.999 ^f	1.000 ^e	.999 ^h	.994 ^f	1 ^f

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

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

d. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

e. Based on 996 samples

f. Based on 999 samples

g. Based on 995 samples

h. Based on 998 samples

HC = Human Capital

SC = Structural Capital

RC = Relational Capital

IC = Intellectual Capital

RP = Research Performance

The above table shows the Relationship between SC, RC, IC and RP while result of score card was bootstrapped to 1000 samples, where all of the items were having positive correlation and the results were highly significant. As from the table it is very much clear that IC was having positive correlation of each items that is 0.923 and 0.963 with HC and SC, while 0.788 and 0.941 with RC and RP. In the end of above table shows that RP was also having positive correlation with all items. It was having correlation of 0.975, 0.971, 0.572 and 0.941 with HC, SC, RC and IC respectively.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

This study is undertaken to identify the impact of Intellectual capital on Research performance of the universities in Pakistan. This study focuses on several research questions which are as follows; Is there a significant impact of Intellectual capital and its components on Research performance of the university?, Which university BZU or IUB has the greater Intellectual capital. Our descriptive analysis found that BZU has higher and positive values

in the all indicators of human, structural and relational capital, which shows that BZU has greater intellectual capital than the IUB. There is a significant difference of numbers among the values of both the universities.

Ratios analysis provides us a clear comparison of the IUB and BZU in respect of intellectual capital, its components and Research performance of the universities. Moreover it also highlighted the impact of intellectual capital and its components on research performance of the universities. In this study the ratios which describe the human capital of the universities were; No. of students per full time teacher, Students per visiting teacher, Percentage of Ph D faculty to total faculty, Ratio of admission to total applicants, and total no. of admission increased as per previous session. All these ratios have greater numbers and percentages for BZU as compared to the IUB. Similarly, in case of structural capital, the ratios which determine the structural capital were; Students per computer, Library books per students, PERN Kb per computer, and Students per Lab. All above mentioned ratios have higher and positive values for BZU. According to the results of these human and structural capital ratios it is concluded that BZU has greater intellectual capital as compare to IUB. The ratio analysis also highlighted the Research performance of the universities and from the results it is concluded that the research performance of BZU is also higher than IUB. As Intellectual capital, its components and research performance of BZU is higher and better than IUB, so it is fact fully and logically concluded that intellectual capital and its components have positive impact on research performance of the universities.

In scoring card table 6-4 and 6-5 a binary stats of comparison among both universities is generated to equate the diverse quantitative data in form of true/false i.e. 1/0 for higher / lower numbers. This scoring board shows the scores of human capital, structural capital, relational capital and research performance gained by the both universities. These scores show the higher scores of the BZU as compared to the IUB. From the results of this scoring card it can be concluded that Research performance and intellectual capital for BZU is greater than the IUB.

In order to investigate the impact of intellectual capital and its components on Research performance of the university, correlation method was used and results confirmed that there is positive correlation among intellectual capital and all its components with research performance of the university. Table 6-6 shows that the Research Performance is positively correlated with Human Capital, Structural Capital, Relational Capital and Intellectual Capital. All pairs of correlation are highly significant except RC: RP with significance value 0.139. Thus, we conclude that intellectual capital has a significant impact on research performance of the universities in general. In terms of impact human capital was ranked first and most important, followed by structural capital while relational capital ranked last among the components. Additionally the effect of human capital was most influential whereas relational capital did not have a significant impact. The evidence shows that the universities' community can be effectively performing their core activities and duties if they utilize and manage intellectual capital in a proper way and this can only be done when they are aware of the benefits and relevant incentives.

6.2 Recommendations

Keeping in views the above discussion and results we can make the following recommendations:-

1. There is a need that both Bahauddin Zakariya university Islamia University should give the main priority to the research at higher level.
2. For this purpose both universities should have its own departmental research Journals where quality research papers of academicians and research students can be published. Presently, these Universities have lacked research publishing facilities.
3. Both Bahauddin Zakariya University and Islamia University have Electronic databases and E-libraray facilities. But their accessibility is very difficult due to unavailability of internet facility and other technical reasons. These hurdles should be removed.
4. New disciplines and advance courses should be introduced at both Universities.
5. Universities should regularly arrange Seminars and conferences, so that new ideas may be exchanged and issues can be resolved.
6. There is a need that universities should design proper program to improve external relations with industry, funding agencies, suppliers and other stakeholders.
7. Universities should provide and published detail information about intellectual capital for tall university stakeholders.
8. Universities should give value to the research and researchers of higher studies.
9. Universities should design annual plans to develop skills, knowledge, competencies, and abilities of their staff and faculty members.
10. Maximum funds should be allocated for research and development projects rather than non-productive projects because without adequate funding research is not possible.

6.3 Limitations of the Study

As this study is a pioneering attempt in Pakistan to examine the impact of IC and its components on research performance of a university so, it also has some limitations which are as follows:

The time and area restrictions are the main limitations of the study. Because of limited time the research may not cover all related aspects fully and only selected only those indicators for intellectual capital and research performance which are presently used by the Higher Education commission of Pakistan, for the Quality and Research based ranking.

One of the main limitations of this study is that only four years data has been taken due to unavailability of reliable data.

6.4 Practical Implications

It is hoped that the findings of research will assist the Universities to better understand Intellectual capital. It helps them to make better decisions that enable them to improve their performance. It will also reduce the uncertainty about intellectual capital. The academic community may also get benefit from this study. Considering the importance and impact of intellectual capital on the research performance of universities, policy makers & academic administrators will achieve academic goals related to teaching, more effectively and efficiently. It will help them in developing curriculum and training its staff more properly.

6.5 Directions for Future Research

This study is a first step towards the highlighting the importance of intellectual capital for universities and its impact on their research performance. However, this study is limited to Pakistani universities. Future research can be conducted in other developing countries as well. Further research is therefore needed to investigate whether these findings generalize to other countries universities and other sectors.

Declaration regarding competing and non-competing interests

I, Prof.Dr.Abdul Ghafoor Awan, hereby declared that I have been serving as Dean, Faculty of Management and Social Sciences, Institute of Southern Punjab,Multan-Pakistan, and received monthly salary for teaching and management. I received no funding from this or any other institution or organization for this research paper. This paper is a joint study. My student, Kashif Saeed, co-author, collected primary data and carried out its analysis under my supervision. I has given final shape to paper which has been submitted for publication.

I hold Ph.D in Business Administration and Economics while co-author is a student of M.Phil Management Science. We have not applied to any institution for patenting, or availing any grant or funding. The publication of this paper will not affect any section of society or institution in any way. We have no interest in the Stock Market and publication of this paper will not affect the price of any share of any listed company.

Author's contribution

This is a joint effort of Dr.Abdul Ghafoor Awa and Mr.Kashif Saeed. Being a supervisor Dr.Awan selected the topic of the paper and sketched the plan of research. Mr.Kashif Saeed, student of MS Business Administration, collected data,tabulated and make its preliminary analysis. Dr.Awan formally analysed the data and draw findings as well as conclusions. He has given the final shape to the paper. In this way, credit go to both authors.

Author's information

Dr.Abdul Ghafoor awan have done Ph.D in Business Administration from University of Sunderland, United Kingdom and also did Ph.D in Economics from Islamia University of Bahawalpur. He is the author of eight books. In September 2014 LAP Publishing Academy, Germany published his book on "Changing World Economic Scenario: Emerging versus Aging Economies" and it is available at Amazon.com. He is serving as Dean, Faculty of Management and Social Sciences, Institute of Southern Punjab-Pakistan, a Degree-Awarding Institution.

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