European Journal of Business and Innovation Research
Vol.2, No.6,pp.21-39, December 2014
Published by European Centre for Research Training and Development UK (www.eajournals.org)

INTELLECTUAL CAPITAL AND RESEARCH PERFORMANCE OF UNIVERSITIES IN SOUTHERN PUNJAB-PAKISTAN

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ABSTRACT: *The main purpose of this study is to examine the concept of Intellectual capital in higher education institutions/universities, justify its importance and its impact on their research output and performance. This study analyzes the impact of Intellectual Capital on university research performance in Pakistani universities and also compares the intellectual capital of two selected universities. This is an important study of the intellectual research area because the growing interest in intellectual capital has been extended from the firms to higher education institutions during the last decade. The major function of a university is exploring and transmitting knowledge which is acquired through research and education. Therefore assessing university research performance and its intellectual capital is a complex and critical issue. Furthermore intellectual capital has become a major driver for sustainable competitive advantage in all the organizations. A literature review is used to describe the intellectual capital, its components and research performance of the universities; it also highlighted the researchers' contributions in this area of study. The study uses exploratory approach to develop the conceptual model and raised these research questions with respect to it; 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. These research questions were investigated through empirical research using a case study approach on two large general public sectors universities of Southern Punjab, Pakistan i.e. IUB and BZU. Secondary data was used and collected for the study. Descriptive, Ratio and correlation analysis were used to study the intellectual capital of the universities and its impact on their research performance. Our descriptive and Ratio 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 then the IUB. The results of these techniques also showed that intellectual capital has a significant impact on research performance of the university in general. According to the findings all the components of intellectual capital also has a significant impact on research performance of the university, although 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 results of this study are useful for the Universities to understand the value of their intellectual capital and exploit them for innovations and efficiency augmentation.*

KEYWORDS: Intellectual Capital, Human Capital, Structural Capital, Relational Capital, University, Research Performance.

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

INTRODUCTION

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 e*t al*. 2001). The success of the organization is promised with the management of these assets.

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 Machlap, but historically the term "intellectual capital" was first time named by John Kenneth Galbrayt 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) defines the intellectual capital as:" a package which consists of useful knowledge for the organization." According to this definition components of this useful knowledge are organizational processes and procedures, technologies possessed, exclusive privileges, skills of the employees and organizational customers, suppliers and stakeholders (Yi, 2010). According to Russ and others intellectual capital includes all organizational processes and intangible assets that are not recorded in the financial statements.

Components of Intellectual Capital

By considering studies of Edvinson & Malon (1997), Roos et al (1997), Bontis et al (1999), intellectual capital includes following three basic components;

Human capital*:* This capital makes a major share of total intellectual capital. It represents the human knowledge. People take away this capital when they leave the organization. It includes employee's skills, their experiences, and innovation power etc.

Structural capital*:* It represents all non human related capital. This capital supports the human capital and provides an infrastructure to hold and make it stronger. There is no threat of losing this capital when people leave the organization because it stays in the organization. It includes

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

vision of the organization, management philosophy, organizational culture, operational process, strategy, data base, and information system.

***Customer/relational capital*:** This capital includes all assets that manage the networking of the organization, its environment and its relationships within and outside the organization. It includes organization's internal and external relationships with customers, suppliers, shareholders, competitors, community, government & regulatory agencies etc.

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 are quite different from today's universities. Those universities were involved in transferring the stored knowledge, at that time they do nothing for the search of new knowledge. In those days the role of a professor was just as a collector, preserver and transferor of knowledge. It was only due to the wrong presumption about the knowledge because they assumed that all they had get is the end of knowledge and this thinking is passing on from one generation of universities to next generation. The new German university model was first time established by the Berlin University in 1809, the founder of this university was Wilhelm von Humboldt. He presented a new idea about the universities; according to him university means producer and transferor of new knowledge. As universities generate new knowledge, so they work as knowledge intensive organization. Due to the tough competition mostly higher education institutions are now straggling for more fund raising and highly qualified faculty members. The core activities of universities are to create and improve knowledge through counseling and scientific research. M. Alipour, (2010) says that in the new economy, knowledge work as an oil and intellectual capital is the factory. 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, data base, policies, procedures and networking with their stakeholders. All these resources are part of their intellectual capital, and despite of its importance only a few universities have taken the challenge of measuring and examine its effect on their performance.

Function of Universities

The growing interest in intellectual capital has been extended from the firms to higher education institutions during the last decade. Universities are considered as the major actor for national innovation. 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), three main functions of universities are:
• 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 an able them to solve the practical problems.
• Services – to serve in communities at different level positions in the organizations and to take

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

part in different activities in local, national, and international communities.
According to Mikulecky and Mikulecka (1999), "University's environment is ideal for the application of intellectual capital management because universities possess advance information's system, proper infrastructure, knowledge sharing facilities and fast accessible sources".

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.

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 BZU or IUB have greater intellectual capital?

Objectives of the 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,

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

empirical evidence regarding intellectual capital effect on research performance of universities is scare in the international literature. Findings in these countries can be applied to the Pakistan's context has not been widely tested.

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.

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 universities. It is only due to the fact that when the industry of a country will grow it will definitely affect the economy of the country in a positive direction. This research helps in providing assistance to the universities in the process of developing their ability to identify and manage their intellectual capital.

LITERATURE REVIEW

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 which create value". In 1962 first effort relating to intellectual capital was taken by Fritz Machlap, but historically the term "intellectual capital" was first time named by John Kenneth Galbrayt 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) defines the intellectual capital as:" a package which consists of useful knowledge for the organization." According to this definition components of this useful knowledge are organizational processes and procedures, technologies possessed, exclusive privileges, skills of the employees and organizational customers, suppliers and stakeholders. He stated that intellectual capital includes all organizational processes and intangible assets that are not recorded in the 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) reviews the literature relating to the models used to measure intellectual capital. The models which were reviewed include; 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) carried out a research about the measurement techniques of intellectual capital. The authors stated that it is very important to measure appropriate value of intellectual capital for the achievement of organizational objectives and strategies. They proposed value chain and the financial cash flow valuation models for the measurement of intellectual capital. The authors also suggested the key components such as know-how skills

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

and information systems of intellectual capital, which must be examine while analyzing the impact of intellectual capital on the value creation.

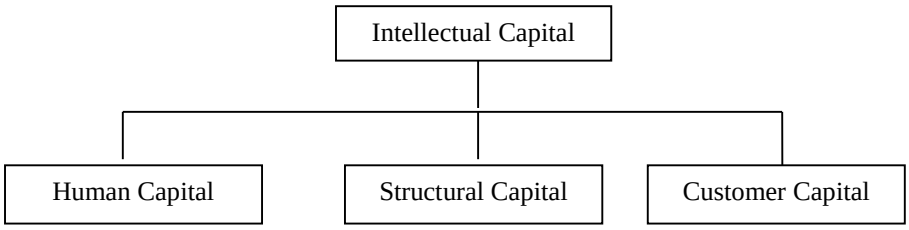
Stewart, T. A. (1999) in his book "Intellectual capital: The new wealth of organizations" provides a groundbreaking visionary evolution of intellectual capital and its powerful impact on the firms. The author describes the importance of intellectual capital and its main practical contribution in uplifting 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 and makes a major share of intellectual capital. It plays a key role in yielding innovation and growth. The second key driver which is described by the author 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 that Intellectual capital "means anything an enterprise can use to increase its competitive advantage in the market place, including knowledge, information, intellectual property rights and experience. In other words, IC is presented as intangible assets and it produces value to enterprises that can be reflected as final income in financial statements, but it cannot be expressed as an accounting title in financial statements".

Components of Intellectual Capital

According to Tai & Chen (2009) intellectual capital can be categories as process capital, innovation, research, and development capital. Svieby (1997) classify 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: Elements of IC (Steward, 1997)



ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

By review the literature of Edvinson & Malon (1997), Roos et al (1997), Bontis (1998), intellectual capital includes three basic components these are;

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Structural capital*:* It represents all non human related capital. This capital supports the human capital and provides an infrastructure to hold and make it stronger. There is no threat of losing this capital when people leave the organization because it stays in the organization. It includes vision of the organization, management philosophy, organizational culture, operational process, strategy, data base, and information system.

Customer/relational capital**:** This capital includes all assets that manage the networking of the organization, its environment and its relationships within and outside the organization. It includes organization's internal and external relationships with customers, suppliers, shareholders, competitors, community, government & regulatory agencies etc.

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 is 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 the employee with their capabilities, skills and education.

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.
Edvins son 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.

Structural Capital

According to Edvinsson 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 the innovation and 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 growth and sharing, it also helpful in increasing productivity of the organization and people. Stewart (1999)

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

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 then 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.

Research Performance

The most important role of the organization is achieving its' cultural, political, social and economical goals. Now a day's organizations are considered as necessary factors in our daily life. They manage people and enable them to do some things which they could not do that without organizations (Daneshvar, 2006). There are many definitions about performance. Some of these definitions which are presented by researchers are as follows:

- Performance is result of employee activities in doing his or her tasks in determined time (Armstrong, 1999).
- Performance is result of an activity or goals fulfillment in which activity is doing the task that should be done (Abtahi, 2002).
- Performance is a set of related behaviors to jobs which employees show (Moorhead & Griffin, 1998). 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 of determining 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.

Intellectual Capital and Performance

Previous empirical studies confirm that intellectual capital has a significant and substantive impact on performance. Min Lu, W. (2012) examined the role of intellectual capital in HEIs'/ Universities. He studied the intellectual capital and its components in teaching and research efficiency. The results confirms 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. The truncated regression analysis showed a positive relationship between components of intellectual capital and university teaching efficiency and research performance. 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 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

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

will affect an increase of 1.278, 1.21, and 1.415 units increase respectively in the financial performance. Sri 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.

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 scare in the international literature. The vast majority of studies on intellectual capital have been undertaken in advanced and emerging economies. Findings in these countries can be applied to the Pakistan's context has not been widely tested. 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.

RESEARCH METHODOLOGY

Nature of study

The use of this type of 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 and purpose of this research as expressed briefly 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.

Research Approach

There are two types of research approaches and inductive approaches.
If hypothesis or research questions are formulated and strategy for the study is designed to test these hypotheses or to answers the research questions, then it can be said that this research approach is deductive.
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 raised, strategies are properly designed to investigate and answers the questions accordingly, thus the research approach for this study is deductive.

Research Strategy

The selection of the appropriate research strategy is the most important step in the research. This step will be taken after taking into account the research questions and objectives. Following are the main research strategies which the researchers can employed in the research these are; survey, case study, experiment, grounded theory, and cross-sectional etc. A case study strategy is used for this research. While selecting the case for this study, Universities in Pakistan was focused.

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

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 recognized by Higher Education Commission of Pakistan both in Private and Public sector.

Sampling

A sample is a small proportion of a population selected for observation and analysis.The selected sample of this research was the large General Public Universities of the southern Punjab, Pakistan. Large General Universities as define by the higher education commission are those which have student enrollment above 7000, due to this only
The Islamia University, Bahawalpur and Bahauddin Zakariya University, Multan have been selected. Southern Punjab has no definite boundaries but where Seraiki language is spoken, therefore three Divisions of Punjab are the part of Southern Punjab. They are: Multan, Bahawalpur and Dera Ghazi Khan. These three divisions comprising of 11 districts, the total area of these districts of Southern Punjab is 99572km^2 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.

Data and type

Secondary data have been used in this study. For the purpose of this study, secondary data have been collected through internet, official websites of the Universities and Higher Education Commission of Pakistan, annual reports of the Universities and Higher Education Commission of Pakistan, and through other official documents and published reports.

Estimation techniques

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

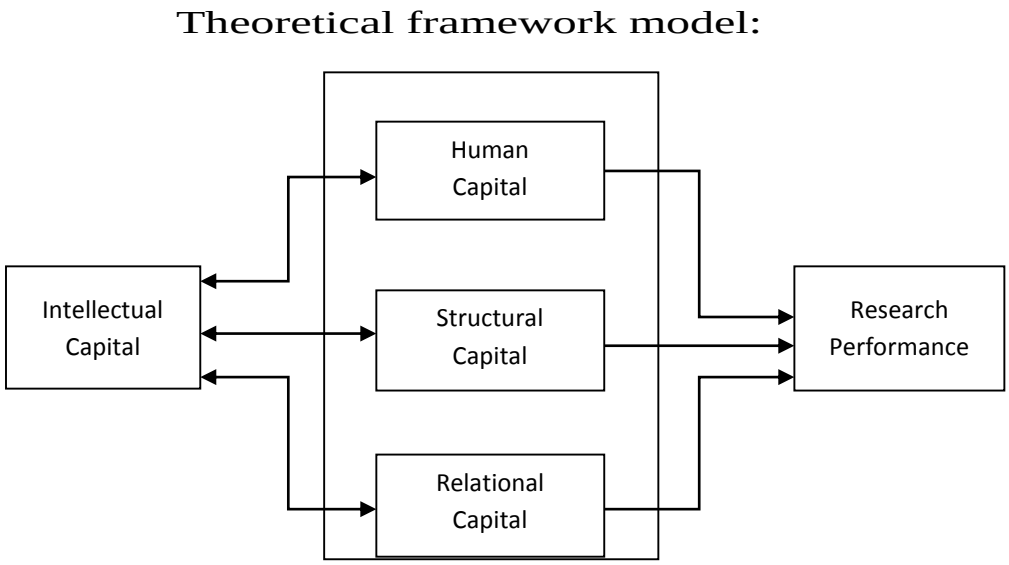
- Descriptive analysis
- Ratio Analysis
- Scoring card Analysis
- Pearson Correlation Analysis

Proposed Model

As the HEC is the main regulator of HEIs in Pakistan. So, the primary indicators of variables are selected from the criteria and methodology of quality and research based ranking of Pakistani HEIs. For this research, on the bases of these selected indicators, the following theoretical framework model is employed to assess the effects of intellectual capital management on research performance of universities.

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

Figure 2 Analytic model of research and effects of variables on each other.



DATA ANALYSIS AND RESULTS

To answer the research questions secondary data provided by the higher education commission was preferred. Although scope of the intellectual capital covers far more elements, but precisely human, structural and relational capital was concern of the study so only selected elements of the data provided were used. Similarly, to meet research questions, the selective outcomes from the scoring card method of calculating intellectual capital were used. Since the study only focused upon the quantitative results of research performance, quantitative data for concerned indicators was used of four sessions from 2008-9 to 2011-12.

Since it is developed fact BZU has the Higher Ranking as compared to IUB in universities ranking issued by Higher education commission. These stats serve far more than this already developed fact. Through these stats we will determine the impact of Intellectual Capital (as whole) and its components Human Capital, Structural Capital and Relational Capital on the Research Performance of the Universities.

Ratio Analysis

Table 1 Summary of Intellectual Capital & Research Performance Ratios of BZU and IUB

Intellectual Capital / Performance Ratios Summaries	The Islamia University of Bahawalpur	Bahauddin Zakariya University, Multan
	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 prevs.*	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 output to total students***	0.51%	1%
Ratio of Ph D output to total students***	0.11%	0.12%

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

*Selected indicators for Human capital
**Selected indicators for Structural Capital
***Selected indicators for Relational Capital
****Research Performance

The above table highlights the different Ratios relating to the Intellectual capital and Research Performance of the IUB and BZU, for the sessions 2008-9 to 2011-12. These Ratios provide a clear comparison of the IUB and BZU in respect of Intellectual capital, its components and Research Performance of the Universities. Moreover these ratios highlighted the impact of intellectual capital and its components on research performance of the 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 applicants 62.1%, Total no. of admission increased as per previous session 13055, and for BZU these average ratios were: 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 increased as per previous session 14639.

It is depicted from the above table 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 ratios 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 described and illustrated the 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 output to total students 0.51%, Ratio of Ph D output to total students 0.11%, and for BZU these ratios were: No. of papers per Research Scholar 1, Ratio of M Phil output to total students 1%, Ratio of Ph D output to total students 0.12%.

Scoring Card Analysis
Our scoring card results are given in the following table.

Table 2 Summary of Intellectual capital and Research performance
Scorecard table for BZU and IUB

	IU B				**BZU**			
	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 above table 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

ISSN 2053-4019(Print), ISSN 2053-4027(Oonline)

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. n 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
	Bootstrap[d]	Bias			.004	.004[e]	-.023[f]	0	.003[f]
		Std. Error			.073	.019[e]	.200[f]	0	.048[f]
		95% Interval	Confidence	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
	Bootstrap[d]	Bias			.000[f]	.002[e]	-.004[h]	.003[f]	0[f]
		Std. Error			.027[f]	.018[e]	.311[h]	.048[f]	0[f]
		95% Interval	Confidence	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

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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 0.923and 0.963 with HC and SC, while 0.788 and 0.941 with RC and RP.In the end above correlation 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.

CONCLUSIONS AND RECOMMENDATIONS

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 then 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. Same in case of structural capital, the ratios which are highlighting and 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 was used and results confirmed that there is positive correlation among intellectual capital and all its components with research performance of the university.

The table 6-6 shows that the Research Performance is positively correlated with Human Capital, Structural Capital, Relational Capital and Intellectual Capital. This positive correlation

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proves that in case of growth in one element will positively increase the growth of other. All pairs of correlation are highly significant except RC: RP with significance value 0.139.

From the results it is concluded that intellectual capital has a significant impact on research performance of the university in general. According to the findings all the components of intellectual capital also has a significant impact on research performance of the university, although 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 where as relational capital did not have a significant impact.The study concluded that the universities' community can be effectively performing their core activities and duties if they utilise and manage intellectual capital in a proper way and this can only be done when they are aware of the benefits and impact of intellectual capital on the university performance.

Recommendations

Based on the results and discussions the following main recommendations and suggestions are drawn for the university stakeholders i.e. students, teaching and non teaching staff, administration, funding agencies, industry and Govt. etc.

- There is a need that university should give the main priority to the research at every level.
- A university should have its own departmental magazine and Journals where quality articles can be published.
- Electronic databases and E-library should be made more accessible and effective.
- New field of studies and advance courses should be introduced.
- Universities should regularly arrange Seminars and conferences, so that new ideas may be welcomed and issues can be resolved.
- There is a need that universities should design proper program to improve external relations with industry, funding agencies, suppliers and Govt. etc.
- Universities should provide and published detail information about intellectual capital for the university stakeholders.
- Universities should give value to the research and researchers.
- Universities should design annual plans to develop skills, knowledge, competencies and abilities of their staff and faculty members.

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 touch all the aspect deeply and only have selected and adopted the same indicators for intellectual capital and research performance which is presently used by the Higher Education commission of Pakistan, for the Quality and Research based ranking. May be some indicators if further explore give the change results.

One of the main limitations of this study is that only four years date has been taken in this research which is only due to the lack of data base and non availability of reliable data. More data can give the change results especially in the context of impact of IC on Research performance.

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Another limitation is location constrains due to resource and time constrains only two large general public universities of Southern Punjab, have been selected.

PRACTICAL IMPLICATIONS

It is hoped that the findings of research will assist the Universities to better understand Intellectual capital. Help them to make better informed 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 maintaining & developing its staff more properly. The findings of this study will assist institutions to attract more new students and in improving community relationships. It will also help the universities to attract more and avail maximum research grants. It also serves as a basis for more research in this area.

DIRECTIONS FOR FUTURE RESEARCH

This study is a first step towards the highlighting the intellectual capital importance for the universities and its impact on their research performance. However, this study is limited to Pakistani universities. Future research can be performed in other developing countries as well. Further research is therefore needed to investigate whether these findings generalize to other countries universities and other sectors. It would also be desirable to see whether an alternative measurement method of intellectual capital gives the same results.

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