



## COMPETITIVENESS OF CIIT SAHIWAL

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### ABSTRACT

*This research aims to evaluate the competitiveness of Comsats Institute of Information Technology (CIIT) Sahiwal with Other Higher Educational Institutions (OEI) of Sahiwal. An Early Warning System (EWS) has been used to analyze expectations and actual feelings of respondents from CIIT and OEI of Sahiwal. The research findings reveal that: (a) CIIT Sahiwal has more innovative capabilities and more competitive advantage as compared to OEI of Sahiwal. (b) The students of CIIT Sahiwal are almost satisfied from their institution however there is a need for further improvement especially regarding social responsibility. (c) The students of OEI of Sahiwal are completely unsatisfied on some points like human resources (HR), government support (GS), innovative learning (IL), library (LB) and social responsibility (SR) and showed almost satisfaction on some other points like research work (RW), international cooperation (IC), examination and assessment (EA) and fee structure (FS).*

**Keywords:** Competitiveness, Innovation, Economic growth

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## INTRODUCTION

### Importance of Innovation

World economy is changing at an incredible pace indicating the importance of value based innovation for the all sectors of a society (Roman, 2012).

In recent decades, importance of innovation has been discussed at large and huge amount of scientific literature has been produced on it, specifying the positive linkage between innovation and economic growth (Manuel, 2011). Factors like management of technology, competitive intelligence, encompassing strategic leadership and specific characteristics of the company's innovation process are important determinants of innovation success.

Through these determinants a company can enhance its innovation and competitiveness (Guimaraes, 2011). Innovation is important both for industry and education sectors wherein, the education sector produces best minds through innovative learning that use knowledge to produce innovation in the industry. Competition and choice necessarily lead to innovations within schools (Lubienski, 2003).

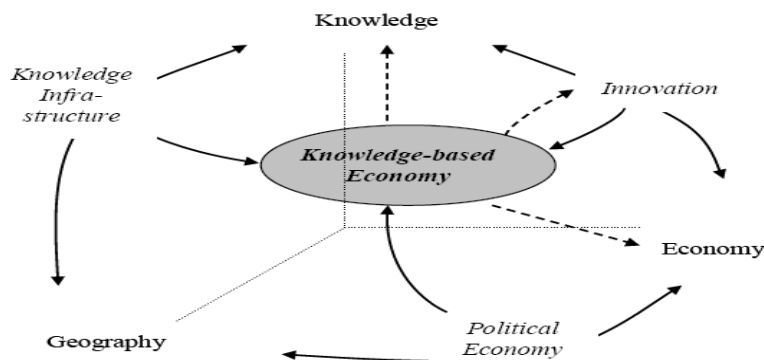
### Innovation Based Economy and National Innovation System

Innovation economics is an economic doctrine that reformulates the traditional model of economic growth so that knowledge, technology, entrepreneurship, and innovation are positioned at the center of the model rather than seen as independent forces that are largely unaffected by policy.

In Triple Helix model based on national innovation system, which includes university–industry–government relations; one can measure the extent to which innovation has become systemic. At the organization level there is a combination among the functions of wealth creation, knowledge production, and normative control takes place.

But at the national level there are exchanges on the market, scholarly communication in knowledge production, and political discourse which tend to distinguish globally (Leydesdorff, 2011). In various countries, the triple helix model has been used to measure the regional development and innovation based economy in which operational strategy are formed (Jacob, 2006; Saad, 2008). Process to generate a knowledge/innovation based economy has been depicted in figure 1.

**Figure-1.**Process to Generate a Knowledge Based Economy



(Source: Leydesdorff and Meyer (2010))

According to [Lundvall \(2002\)](#) the concept of “national system of innovation” has diffused very rapidly. The concept includes the combination of different ideas like production structure and relationships between these contributing to innovation and competence building.

With regards to the National innovation system (NIS) of Pakistan ([Hameed, 2007](#)), it has been found that a lot of misunderstanding and anxiety exists at the policy-making level and, that there has no previous work done in this area. In Pakistan, only the United Nations International Development Organization (UNIDO) and Ministry of Science & Technology work together on Technology Foresight Project. HEC facilitates the Patenting process for scientists; Online patent filing through secure online site; Assesses Idea/Invention for Patentability; etc. HEC also facilitates the Universities to acquire and disseminate knowledge; creation of knowledge; producing knowledge workers for the socio-economic development of Pakistan ([Naqvi, 2006](#))

### **Statement of the Problem**

“Pakistan’s economy is in turmoil because of its weak education sector requiring immediate enhancement of its competitiveness”. ([Ahsan, 2011](#)); ([Muhammad, 2009](#));([Nazir, 2005](#)).

### **Objectives of Research**

- ✚ To evaluate the competitiveness of Comsats Institute of Information Technology (CIIT) Sahiwal in comparison with Other Higher Educational Institutions (OEI) of Sahiwal.
- ✚ To evaluate the satisfaction level of students belonging to CIIT Sahiwal and OEI of Sahiwal and then make a comparison.

### **Educational Institute and Competitiveness**

There are many factors that enhance the competitiveness of an educational institute, one being International Cooperation. The concept of globalization has led to make more and more strategic alliances among multiple partners across national borders.

Similarly, Human resources are also very important for an organization especially to get competitive advantage. According to [Bratton \(1999\)](#) human resources can be defined as “the part of the management process that specializes in the management of people in work organizations”.

Human resources management (HRM) emphasizes that employees are critical to achieving sustainable competitive advantage; that human resource practices need to be integrated with the corporate strategy, and that human resource specialists help organizational controllers to meet both efficiency and equity objectives.” Human Resource Development (HRD) produced miracles in twentieth century. HRD is very important for economic development of a country and it increases gross national products (GNP) and overall productive activities ([Ravinder, 2006](#)).

Campus facilities include multimedia, hostels, transportation, swimming pools, play grounds, clubs and social society play a vital role in developing an environment of learning. Moreover, physical development increases the student perception about the campus / institute (Razak, 2011). The facility management is also very important for an organization; as it is directly or indirectly involved in asset management, and, it is also important for higher learning institutions (Saleh, 2011). At the university level, creativity and innovation thinking enhances through an experiential learning environment (Ayob *et al.*, 2011).

Innovative learning includes the culture of innovation, practical oriented education, and, development of new ideas which students bring. Innovative learning depends on teacher training, i.e. motivating teachers towards innovative thinking (Mooi, 2010).

## RESEARCH METHODOLOGY

### Data Collection

The purpose of this study is to evaluate the competitiveness of CIIT Sahiwal in comparison with OEI in Sahiwal. For this, the data has been collected from the students of CIIT Sahiwal and OEI of Sahiwal.

A Self administered Questionnaire Survey was conducted and a total of 500 valid responses were taken for analyses, i.e. 250 students from CIIT Sahiwal and 250 students from OEI of Sahiwal (Table 1). OEI includes Accute College of commerce Sahiwal, Command College Sahiwal, Bahauddin Zakariya University Sahiwal Campus, Government College Sahiwal, High Career Group of colleges Sahiwal. With reference to literature studied, following variables were included in the questionnaire for which perceptions of respondents were taken into considerations: Campus Facilities (CF), Social Responsibility (SR), Fee Structure (FS), Library (LB), Innovative Learning (IL), Examination and Assessment (EA), Government Support (GS), Human resources (HR), Research Work (RW), International Collaboration (IC).

### Early Warning System

In this study Early Warning System (EWS) (Xiandao, 2007) has been used to evaluate the competitiveness of CIIT Sahiwal and OEIs of Sahiwal.

The EWS consists of following three parameters:

- |    |                                    |        |
|----|------------------------------------|--------|
| a) | $0 < F < \bar{X} - 3SD$            | Red    |
| b) | $\bar{X} - 3SD < F < \bar{X} - SD$ | yellow |
| c) | $\bar{X} - SD < F < 10$            | Green  |

Green = Satisfactory and above expectations

Yellow = Almost satisfactory but needs improvement

Red = Unsatisfactory and below expectations

### Sampling Techniques

Probability sampling technique has been used in this study and initially a sample size of 700 students was taken, i.e. 350 students from CIIT Sahiwal and 350 students from OEI Sahiwal. After careful screening a total of 500 valid responses were left, i.e. 250 students are from CIIT Sahiwal and 250 students from OEI Sahiwal. The questionnaire included close ended questions seeking students' expectations and actual perceptions regarding ten factors as mentioned above, and, were rated on a likert scale ranging from 1 (Not very important) to 10 (Very important).

### LIMITATIONS TO STUDY

This research is region specific, i.e. Sahiwal focused only. For the sake of convenience, students were selected as respondents of the survey only, belonging to CIIT Sahiwal and Five Other Educational Institutes of Sahiwal. All Educational Institutes of Sahiwal have not been included in this study.

### Data Analyses and Interpretation

Demographic analyses of the data collected through questionnaire survey have been carried out. CIIT and OEI respondents have been classified according to gender, age group, qualification, and sources of information and institution characteristics/features (Table 2).

### Early Warning System

With the help of Early Warning System (EWS), the competitiveness of CIIT & OEI of Sahiwal have been evaluated. In which, expectations and actual feelings of the respondents have been compared

### Actual Feeling/Satisfaction of CIIT & OEI of Sahiwal Respondents

#### (A): Calculating Average of Respondents for Each Scale against Each Index

Following model has been used to calculate the average.

$$X_{ij} = \frac{X_{ij}}{\sum_{i=1}^n X_{ij}} \quad (1)$$

Where, index = I = 1, 2, 3 ..... 10

And scale = j = 1, 2, 3 ..... 10

Whereby  $X_{ij}$  represents the number of responses against each index on each scale which is then divided by the total number of responses, i.e. 250 for CIIT Sahiwal & OEI Sahiwal respectively to calculate the average number responses for each index given in the following form.

$$R = \begin{bmatrix} r_{11} & r_{21} & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & r_{2m} \\ \dots & \dots & \dots & \dots \\ n_1 & n_2 & \dots & r_{nm} \end{bmatrix} \quad (2)$$

**(b): Calculating weighted actual feelings/satisfaction of CIIT & OEI of Sahiwal respondents**

The weighted actual feelings of respondents are calculated with the help of the following formula,

$$X = [R] \times [J] \quad (3)$$

Where R represent the average value of each index on each scale ascertained in equation 2, and j represents the number of scale ranging from 1 to 10.

$$X = \begin{bmatrix} r_{11} & r_{21} & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & r_{2m} \\ \dots & \dots & \dots & \dots \\ n_1 & n_2 & \dots & r_{nm} \end{bmatrix} \times \begin{bmatrix} j_1 \\ j_2 \\ \dots \\ j_n \end{bmatrix}$$

Wherein the each values in the first Column of R is multiplied with the first row of jn, each values in the second column of R is multiplied with the second row of jn, up till each value in the last row multiplied with the last column of jn. That would give the result as depicted in table 3.

**Expectations of CIIT & OEI of Sahiwal Respondents**

Expectations of respondents regarding each index have been used to calculate arithmetic mean ( $\bar{X}$ ), standard deviation (SD) and standard deviation, times 3 as represented in column 1, 2, and 3 of table 4 respectively.

**Comparison between Expectations and Actual Feeling of CIIT Sahiwal**

As obvious from the results provided in Table 5, all of the weighted average values lie within the range of column 2 and marked as “yellow” except SR which lies in column 3 and marked as “Red”, being unsatisfactory. This implies that, on average CIIT Sahiwal has been working well and meets the expectations / demand of CIIT Sahiwal students. But additional efforts are required to enhance the satisfaction level. On the other hand, CIIT does not fulfill the expectations of its students regarding SR. It also implies that the students of CIIT Sahiwal are aware of social welfare and community services, and, also expect CIIT Sahiwal to full that responsibility.

**Comparison between Expectations and Actual Feeling of OEI of Sahiwal**

As obvious from Table 6,

## Wherein

Column 1=Satisfactory and above expectations (Green); column 2=Almost satisfactory but needs improvement (Yellow); Column 3=Unsatisfactory and below expectations (Red).The weighted average values of RW, IC, EA and FS lie within the range of column 2 and marked as “yellow”. This implies that, on average the OEI of Sahiwal is working well and somehow meets the expectations / demand of their students. But additional efforts are required to enhance the satisfaction level.The weighted average values of HR, GS, IL, LB and SR lie within the range of column 3 and marked as “Red”. OEI of Sahiwal do not fulfill the expectations of their students regarding these factors. The weighted average values of C lie within the range of column 1 and marked as “green”. This implies that, on average, the OEI are working according to the expectations/ demand of their students.

## Comparison between CIIT and OEI of Sahiwal

Here comparison between CIIT Sahiwal capabilities and OEI capabilities has been performed. To check out which one is comparatively better than the other.

By comparing Table 5 and Table 6; we can see that CIIT has only one “Red” box which is unsatisfactory regarding SR and all other are “yellow”. This shows that students of CIIT Sahiwal are almost satisfied but CIIT needs to improve. On the other hand, OEI have five “Red” boxes which are for HR, GS, IL, LB and SR meaning unsatisfactory and below than expectations. Also, there are four “yellow” boxes, which are for research RW, IC, EA and FS showing “almost satisfaction” but needs improvement. And one “green” box which shows satisfaction and above expectations. So, overall CIIT Sahiwal is comparatively better than OEI. The average values of actual feeling of OEI respondents for only two indexes are more than the average values of actual feelings of the CIIT Sahiwal respondents, i.e. CF and FS.

The average actual feelings of CIIT Sahiwal respondents for all the other indexes are more than the average actual feelings of OEI.Hence it is clear that OEI respondents have more expectation then CIIT Sahiwal respondents. As it shown in Table 7, total points of expectations for OEI are 86.929 and for CIIT are 82.968 respectively having a difference of 3.961 points. On the other hand; OEI have total of 38.464 points of actual feelings and CIIT has a total of 44.548 points for actual feelings having a difference of 6.084. Implying that the actual feelings/satisfaction of CIIT respondents are more than the actual feelings/satisfaction of OEI.

## DISCUSSION

CIIT Sahiwal is more competitive and has more innovative capabilities than OEI of Sahiwal. Results show that the students of CIIT Sahiwal are almost satisfied from their institution.

However there is a need for improvement and enhance the satisfaction level of students to maintain their position. This Research also shows that the students of OEI are not satisfied and there is a mix trend of their satisfaction. They are completely unsatisfied on some points and showed half satisfaction on some other points. There is a need of lot of improvement to raise the level of satisfaction. CIIT Sahiwal and OEI of Sahiwal should focus positively on corporate social responsibility (CSR) for the welfare of students and community. CIIT Sahiwal should more focus on technology; it should include more technology especially regarding IL and LB. OEI of Sahiwal should improve its LB resources, get access to E-Books and Higher Education Commission's (HEC) Digital Library. Furthermore, OEI should focus on providing innovative learning to students and for this purpose they should promote culture of innovation, become student oriented and appreciate new ideas. OEI should improve their human resources and hire more highly qualified, experienced and skilled teachers.

## CONCLUSIONS

Educational institutes play a vital role in the development of a knowledge based economy, and for this they need to become competitive as well as innovative. This study was conducted to evaluate the competitiveness of CIIT in comparison with Other Educational Institutes of Sahiwal with the help of an Early Warning System. The results showed that the students of CIIT Sahiwal are satisfied from their institute whereas students of OEI of Sahiwal are not. Yet, there is still need for CIIT to further improve in order to remain competitive in Sahiwal.

## ANNEXURE

### Competitiveness of CIIT, SAHIWAL Campus

Please "Mark" or "Highlight" the appropriate answer(s).

**General:(More than one can be selected)**

**I-** How did you access relevant information to take admission in the institution?

(a) Newspaper (b) TV (c) Radio (d) Exhibition (e) Friend (f) Internet (g) Other

**II-** What were the most important characteristics you considered to select the institution?

(a) Research Work / Projects (b) Good will (c) Value of Degree (d) HEC Affiliation (e) Fee Structure (f) Other

**III- Expectations:** Please rank the following features to the extent that you think are important for the Competitiveness in the institutions.

1 (Not very important) to 10 (Very important)



Index	Features	Contents	1	2	3	4	5	6	7	8	9	10
1	Research Work / Projects	New Research, New Working Areas, Laboratory Facilitation, etc.										
2	International Cooperation	Collaboration With Other Institutions Including Foreign Institutions, Teacher / Students Exchange Programs, etc.										
3	Human Resources	Teacher / Staff Skills & Experience, Foreign Qualified, etc.										
4	Examination and Assessment	Semester system, CGPA Criteria, Reward Criteria, Arrangement of Monitoring Quality of Teaching etc.										
5	Government Support	Supportive Infrastructure, Government Funding / Investment, etc.										
6	Campus Facilities	Multimedia, Hostels, Transportation, Swimming Pools, Play Grounds, Clubs, Social Society, etc.										
7	Innovative Learning	Culture of Innovation, Student Oriented. Appreciation of New Idea, etc.										
8	Library	Infrastructure, Quantity / Quality of Books, E-Books, Print Resources, Electronic Data Base, Online Lectures, etc.										
9	Fee Structure	Admission Fee, Annual Tuition Fee, Other Dues, etc.										
10	Social Responsibility	Need Base Scholarships, Social Welfare, Community Services										

**Personal information:**

IV - Gender: (a) Male (b) Female

V - Region of Origin: (a) Punjab (b) Baluchistan (c) Sindh (d) Khyber Pakhtunkhwa

VI - Qualification: (a) Under Graduation (b) Graduation and Above

VII- Age Group: (a) 15-20 (b) 21-25 (c) 26-30 (d) 31 or above

VIII- Institution: (a) COMSATS Sahiwal (b) Other. . . . .

**IX -Level of satisfaction (Actual Feelings):** Based on Your own perceptions / information /experience of studying in an Education institution, please rank the following features to the extent you think your own institution possesses.

1 (very low) to 10 (Very high)

Index	Features	Contents	1	2	3	4	5	6	7	8	9	10
1	Research Work / Projects	New Research, New Working Areas, Laboratory Facilitation, etc.										
2	International Cooperation	Collaboration With Other Institutions Including Foreign Institutions, Teacher / Students Exchange Programs, etc.										
3	Human Resources	Teacher / Staff Skills & Experience, Foreign Qualified, etc.										
4	Examination and Assessment	Semester system, CGPA Criteria, Reward Criteria, Arrangement of Monitoring Quality of Teaching etc.										
5	Government Support	Supportive Infrastructure, Government Funding / Investment, etc.										
6	Campus Facilities	Multimedia, Hostels, Transportation, Swimming Pools, Play Grounds, Clubs, Social Society, etc.										
7	Innovative Learning	Culture of Innovation, Student Oriented. Appreciation of New Idea, etc.										
8	Library	Infrastructure, Quantity / Quality of Books, E-Books, Print Resources, Electronic Data Base, Online Lectures, etc.										
9	Fee Structure	Admission Fee, Annual Tuition Fee, Other Dues, etc.										
10	Social Responsibility	Need Base Scholarships, Social Welfare, Community Services										

**Future Prospects:**

X - In Your opinion, what are the possibilities and opportunities for **your own university** to keep its pace in near future?

- (a) Not much      (b) General      (c) Great

**Table-1.** CIIT & OEI of Sahiwal Respondents

Gender	CIIT Sahiwal Respondents	OEI Sahiwal Respondents
Male	157	136
Female	93	114
<b>Total</b>	<b>250</b>	<b>250</b>

**Table-2.** Demographic Analyses of CIIT & OEI of Sahiwal

Factors	contents	Responses of CIIT	Total	Responses of OEI	Total
<b>Gender</b>	Male	157		136	
	Female	93	250	114	250
<b>Age Group</b>	15-20	139		90	
	21-25	104		145	
	26-30	7	250	14	250
	31 and Above	0		1	
<b>Qualification</b>	Undergraduates	204		155	
	Graduation and Above	46	250	95	250
<b>Institute</b>	Acute	0		17	
	BZU	0		133	
	Command	0		24	
	GCS	0	250	37	250
	High Career	0		39	
	CIIT Sahiwal	250		0	
<b>Sources Of Information</b>	Newspaper	65		60	
	TV	8		18	
	Radio	2		7	
	Exhibition	14	321	8	321
	Friends	129		125	
	Internet	72		40	
	Others	31		35	
<b>Institution Characteristics / Features</b>	Research Work / Projects	29		20	
	Goodwill	46		43	
	Value of Degree	123		99	
	HEC Affiliation	84	351	72	308
	Fee Structure	34		56	
	Others	35		18	

**Table-3.** Calculating Weighted Actual Feelings/Satisfaction for CIIT & OEI of Sahiwal Respondents

Weighted Average Index	CIIT Sahiwal Total (F)	OEI Sahiwal Total (F)
<b>RW</b>	4.4	3.728
<b>IC</b>	4.612	3.428
<b>HR</b>	5.436	4.016
<b>EA</b>	4.948	3.944
<b>GS</b>	4.416	3.8
<b>CF</b>	3.976	4.052
<b>IL</b>	4.052	3.64
<b>LB</b>	4.42	3.704
<b>FS</b>	4.236	4.672
<b>SR</b>	4.052	3.48

**Table-4.** Mean and Standard Deviation for Expectations of CIIT & OEI Sahiwal Respondents

Index	CIIT Sahiwal			OEI Sahiwal		
	Average	Standard Deviation	3 * SD	Average	Standard Deviation	3 * SD
	-2	-3	-3	-1	-2	-3
<b>RW</b>	8.028	2.1235	6.3705	<b>8.084</b>	1.99923	5.9977
<b>IC</b>	<b>7.888</b>	1.80235	5.40704	8.284	2.32399	6.97198
<b>HR</b>	8.48	1.61618	4.84855	8.748	1.46598	4.39794
<b>EA</b>	7.956	1.93106	5.79317	8.424	1.74827	5.24481
<b>GS</b>	8.12	1.83277	5.4983	<b>9.553</b>	1.58859	4.76578
<b>CF</b>	8.712	1.66618	4.99854	9.132	<b>5.89351</b>	<b>17.6805</b>
<b>IL</b>	8.392	1.61765	4.85296	8.6	1.38262	4.14787
<b>LB</b>	8.604	<b>1.51538</b>	<b>4.54613</b>	8.72	<b>1.33894</b>	<b>4.01683</b>
<b>FS</b>	7.96	<b>2.15615</b>	<b>6.46846</b>	8.54	1.74717	5.24152
<b>SR</b>	<b>8.828</b>	1.52832	4.58496	8.844	1.44082	4.32247

**Table-5.** Comparison of Weighted Actual Feeling of CIIT Sahiwal Respondents with the Criterion of Satisfaction of Each Index

Index	$\bar{X} - SD < F < 10$		$\bar{X} - 3SD < F < \bar{X} - SD$		$0 < F < \bar{X} - 3SD$		F	Remarks
	(1)	(2)	(3)	(4)	(5)	(6)		
<b>RW</b>	5.9045	10	1.657499	5.9045	0	1.657499	4.4	Yellow
<b>IC</b>	6.085654	10	2.480963	6.085654	0	2.480963	4.612	Yellow
<b>HR</b>	6.863817	10	3.63145	6.863817	0	3.63145	5.436	Yellow
<b>EA</b>	6.024943	10	2.16283	6.024943	0	2.16283	4.948	Yellow
<b>GS</b>	6.287233	10	2.621698	6.287233	0	2.621698	4.416	Yellow
<b>CF</b>	7.045819	10	3.713456	7.045819	0	3.713456	3.976	Yellow
<b>IL</b>	6.774346	10	3.539039	6.774346	0	3.539039	4.052	Yellow
<b>LB</b>	7.088622	10	4.057867	7.088622	0	4.057867	4.42	Yellow
<b>FS</b>	5.803847	10	1.491541	5.803847	0	1.491541	4.236	Yellow
<b>SR</b>	7.299681	10	4.243043	7.299681	0	4.243043	4.052	Red

**Table-6.** Comparison of Weighted Actual Feeling of OEI Respondents with the Criterion of Satisfaction of Each Index

Index	$\bar{X} - SD < F < 10$		$\bar{X} - 3SD < F < \bar{X} - SD$		$0 < F < \bar{X} - 3SD$		F	Remarks
	(1)	(2)	(3)	(4)	(5)	(6)		
<b>RW</b>	6.084767	10	2.086302	6.084767	0	2.086302	3.728	yellow
<b>IC</b>	5.960006	10	1.312018	5.960006	0	1.312018	3.428	Yellow
<b>HR</b>	7.282022	10	4.350065	7.282022	0	4.350065	4.016	Red
<b>EA</b>	6.675729	10	3.179188	6.675729	0	3.179188	3.944	yellow
<b>GS</b>	7.965191	10	4.788003	7.965191	0	4.788003	3.8	Red
<b>CF</b>	3.238486	10	-8.54854	3.238486	0	-8.54854	4.052	Green
<b>IL</b>	7.217377	10	4.452131	7.217377	0	4.452131	3.64	Red
<b>LB</b>	7.381056	10	4.703168	7.381056	0	4.703168	3.704	Red
<b>FS</b>	6.792828	10	3.298484	6.792828	0	3.298484	4.672	yellow
<b>SR</b>	7.403178	10	4.521534	7.403178	0	4.521534	3.48	Red

**Wherein:**

Column 1=Satisfactory and above expectations (Green); column 2=Almost satisfactory but needs to improvement (Yellow); Column 3=Unsatisfactory and below expectations (Red).

**Table-7.**comparison of the Expectations and Actual Feeling of CIIT Sahiwal and OEI Respondents against Each Index

Index	CIIT EXP	OEI EXP	Difference	CIIT ACT	OEI ACT	Difference
	(1)	(2)	(1 - 2 = 3)	4	5	(4 - 5 = 6)
<b>RW</b>	8.028	8.084	<b>-0.056</b>	4.4	3.728	0.672
<b>IC</b>	7.888	8.284	<b>-0.396</b>	4.612	3.428	1.184
<b>HR</b>	8.48	8.748	<b>-0.268</b>	5.436	4.016	1.42
<b>EA</b>	7.956	8.424	<b>-0.468</b>	4.948	3.944	1.004
<b>GS</b>	8.12	9.553	<b>-1.433</b>	4.416	3.8	0.616
<b>CF</b>	8.712	9.132	<b>-0.42</b>	3.976	4.052	<b>-0.076</b>
<b>IL</b>	8.392	8.6	<b>-0.208</b>	4.052	3.64	0.412
<b>LB</b>	8.604	8.72	<b>-0.116</b>	4.42	3.704	0.716
<b>FS</b>	7.96	8.54	<b>-0.58</b>	4.236	4.672	<b>-0.436</b>
<b>SR</b>	8.828	8.844	<b>-0.016</b>	4.052	3.48	0.572
<b>Total</b>	<b>82.968</b>	<b>86.929</b>	<b>-3.961</b>	<b>44.548</b>	<b>38.464</b>	<b>6.084</b>

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**REFERENCES**

- Ahsan, N., 2011, 2011. Dual and Poor Education System in Pakistan. Available from <http://blogs.dunyanews.tv/?p=2373>.
- Ayob, A., A. Hussain, M.M. Mustafa and M. Shaarani, 2011. Nurturing creativity and innovative thinking through experiential learning. *Procedia - Social and Behavioral Sciences*, 18: 247-254.
- Bratton, e.a., 1999. *Human resource management theory and practice* London: Macmillan Press Ltd.
- Guimaraes, T., 2011. Industry clock speed's impact on business innovation success factors. *European Journal of Innovation Management* 14(3): 322 – 344.
- Hameed, T., 2007. National innovation system of pakistan.
- Jacob, M., 2006. Utilization of social in science policy systems of innovation triple helix and vinnova. *Social Science Information* 45: 431-462.
- Leydesdorff, L., 2011. The triple helix quadruple helix and an n-tuple of helices explanatory models for analyzing the knowledge-based economy 25–35.

- Leydesdorff, L. and M. Meyer, 2010. The decline of university patenting and the end of the bayh-dole effect 83(2): 355-362.
- Lubienski, C., 2003. Innovation in education markets: Theory and evidence on the impact of competition and choice in charter schools. American educational research journal 40: 395-443.
- Lundvall, e.a., 2002. National systems of production, innovation and competence building. Department of business studies. Aalborg university aalborg Denmark.
- Manuel, G., 2011. Building an innovation function with patents and trademarks evidence from portuguese regional innovation systems building an innovation function with patents and trademarks. Evidence from portuguese regional innovation systems.
- Mooi, L., 2010. Teacher education innovative effectiveness and global sciences. World conference on learning teaching and administration papers 1815-1820.
- Muhammad, A.Q., 2009. Human development, public expenditure and economic growth: A system dynamics approach. International Journal of Social Economics, 36(1/2): 93-104.
- Naqvi, S., 2006. Role of higher education in the national innovation system.
- Nazir, R., 2005. Humanization of education in Pakistan through freir's concept of literacy. Asia Pacific Education Review, 6(1): 1-6.
- Ravinder, R., 2006. Education and human resource development in post independent eritrea. International Journal of Education and Development using Information and Communication Technology 2(4): 67-81.
- Razak, e.a., 2011. Campus sustainability student's perception on campus physical development planning in Malaysia. In: 2nd International Building Control Conference. pp: 230-237.
- Roman, e.a., 2012. Theoretical and Applied Economics 19: 113-126.
- Saad, e.a., 2008. The triple helix strategy for universities in developing countries the experiences in Malaysia and Algeria 35: 431-443.
- Saleh, e.a., 2011. An approach to facilities management (fm) practices in higher learning institutions to attain a sustainable campus (case study: University technology mara - uitm). In: 2nd International Building Control Conference pp: 269-278.
- Xiandao, S., 2007. Research on the mathematic model of customer satisfaction with alarming function. Journal of Wuhan University of Technology 29(7): 168-173.

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