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Effectiveness of IT in Business Education: A Case of Business Schools in Pakistan

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Abstract: Lucrative, cost-effective and time saving developments in Information Technology have created a revolution worldwide. Pakistan is among the beneficiaries economies where the business community stimulates to incorporate IT resources in their organizational culture for speedy, reliable, and economical solutions. Local universities are no exception to that and are actively involved in research, training and developing IT-based systems, procedures and tools to transform conventional styles into effective and efficient IT led educational system. The study analyzes the effectiveness of IT in business education. The emphasis is on the impact of IT on business graduates academics. The study argues that mere allocation of funds for the development of IT resources does not produce the graduates of market expectations. Business schools have to ensure the effectiveness and efficiency of their investment and must also critically monitor the learning progress of their business graduates. Sample data of 254 business graduates is collected from the three leading universities of Lahore; COMSATS Institute of Information Technology, University of the Punjab and University of Management and Technology. Sample data also includes Government College University, Faisalabad as a special case which hires visiting faculty only. The findings conclude that business graduates from Government College University Faisalabad are more satisfied. Their graduates find significant improvement in studies after attending IT courses. Overall business graduates find more improvement in the general usage of computers and show deficiencies in specific usage (related to different specialized fields of business education). Majority of them recommended to include more practical issues and latest technology in IT curriculum.

Key words: Business education, information technology, effectiveness

INTRODUCTION

Usage of technology in teaching business education has been widely hailed in literature as inevitable and beneficial[1,2]. Technology inherently not good or bad but a neutral, its usage decides the ultimate advantages and disadvantages. Lynn and Philips[3] raised two questions on the value of technology in education (1) what are the perceived educational benefits of the new learning technologies? and (2) how ready and willing are students to take advantage of these benefits?

Another concern addressed in the literature is that business related academic programs are often too theoretical. As a result they do not produce graduates equipped with the skills and capabilities which industry values and requires[4-7] believe that academia lacks the motivation of a real-life driving force is the main reason of not responding automatically to current industry demands. Academicians believe that up-to-date developments in hardware and software technologies; knowledge of the current practices in terms of business models and applications would enable students to build the required competencies[8].

Business schools have started incorporating IT related course in their curriculum to address the drastic changes in business environment and response to newly created business culture. The reduction in the costs of IT has also made possible for business schools to suitably equip themselves with required equipments[9]. Criticism on traditional modes of teaching is that it makes students passive. Traditional teaching make students more teachers dependent rather than self directed and motivated. Akerlind and Trevitt[10] perceived a danger in using technology to rush students into more self-directed, autonomous approaches to learning without adequate preparation. Easy access to web can be misused and reduces the quality of learning[11]. A more balanced approach is to mix up IT with the face to face teaching in the class rooms proved more successful[12].

The whole debate moves towards a utilitarian view, that students should be equipped with skills that are of immediate use in the workplace[13]. Technical skills are more useful in smaller organizations which face constraints such as time, cost and availability of information systems skills[14].

Research issues and business education in Pakistan: Business Education in Pakistan started back in 1955 with an opening of Institute of Business Administration in University of Karachi, Karachi. University of the Punjab

started offering Master in Business education in 1962. Both university started business education programs with the help of US Aid. It was primarily the public universities which offered graduate programs. Lahore University of Management Sciences, Lahore was the first in the private sector which started business studies in 1986. Business education gets competitive since 1992 with the emergence of seventy six new universities and institutions with degree awarding status. New entrances also provide students with the opportunities to get admission in the universities/institutes which best meet their expectations. Students are also moving towards business education after graduation and even after master degrees from other disciplines like Computer Science, Electronics, Social Sciences or Arts and even Medical. Stepping up towards business education is the top choice due to interdisciplinary nature of business program and its demand in the market. The highly competitive scenario in business education requires a comprehensive empirical study. This study is a part of these efforts. It investigates the effectiveness of IT in business education and has raised many considerations like:

- To what extent are public and private business schools in Pakistan meeting the expectations of their students?
- Do discrepancies exist among students expectations towards the effectiveness of IT education provided at business schools?
- Do business students through their professional studies, acquired the IT skills and capabilities needed in the workplace?
- What areas are needed to be prioritized for improving the effectiveness of IT education at business schools?

The study tries to respond some of the issues raised above. It assumes that mere allocation of IT resources is not enough to meet the students expectations. Business schools have to ensure the effectiveness and efficient usage of their investment and critically monitor the learning progress of their graduates. The study also identifies the missing area in IT education, which the business schools need to address and to prioritize.

Literature review: Role of IT in business education has been widely discussed in the literature. Numbers of researchers investigate the effectiveness of IT from different dimensions including its teaching methodology for business schools[15,16].

Importance of IT: Turnbull[17] believed that business schools have failed to move with the times. Business schools are slow to respond to the idea that learning must be continuously accessible. They still believe, they are the guardians of knowledge and learning and that students must attend courses to learn. Students must concentrate on functional subject areas such as marketing and finance, at the expense of interpersonal skills, such as team working, rather then using new technology and become more independent decision makers.

Ehrmann[18] named the IT advancements as third revolution, facilitating computing, video, and telecommunication. This revolution brought about more learners and inevitable changes in the way higher education delivers its services whether on campus or at a distance over newly established networks. Ehrmann put emphasis on the value of information technology in higher education by stating that technology (in the broadest sense of that term) is providing a foundation for the reorganization of higher learning.

Carlson[19], blamed the academe is still lagging behind society at large in the application of some technology trends such as personal digital assistance devices (e.g., Palm Pilot) that campuses have not been able to integrate into educational context. Achenreiner[20] urged that in todays business environment it is readily apparent that tomorrows graduates are expected to be much more technologically literate than previous generations of graduates. Michael and Iddo[21] said that, the growing use of IT in teaching and learning means that long-standing assumptions about the relationship between time, place and learning are breaking down. IT means that students do not need to attend a particular place; they also do not have to learn at particular times or in particular ways. Michael and Iddo believed that students have also become conscious and think to be get trained how to live in todays technological advanced world. They come from different social and academic backgrounds requiring different pedagogic approaches to adjust themselves. Business graduates demand more flexible approaches to studying in order to accommodate their family and work commitments.

Application of IT: The business education system with the use of IT resources can produce more entrepreneurial graduates who are willing to take risks and test new ideas. Twining[9,22] suggested goals for IT training which include the basic computer knowledge and then followed by the software packages in support of business applications. Rowley and Coles[23] believed that students in secondary and higher education need to acquire IT skills, and that these IT skills should include Word Processing, Spreadsheets, Graphics and Databases. Researchers like[24-26] have also pointed out many missing areas of IT in business education and documented

computer applications for business education including Internet, Presentations, Spreadsheets, Rosters, Posters, Reports, and other written documents for Accounting, Marketing, Finance, Career Exploration, Distance Education, Records Management, and other courses. Ellis[27], in a study of computer applications for business education reported that electronic mail or e-mail is the backbone application of the internet. He concluded that e-mail is responsible for the rapid growth of the internet because it provides an easy communication medium that is very user friendly. Ahnager and Little[28] also indicated that the accessibility of the World Wide Web (www) and its flexibility for conveying digital information in various forms makes it a convenient mode of communication for education. Wagner[29] described the world wide web as a computer technology that allows the possible integration of full-color graphics, varying typefaces, animation, and sound. Wilson[30] added that the multimedia technology available on the internet includes full motion videos and sound. He recommended that the students who use internet should learn: (a) how to peruse materials posted on internet pages, (b) to work cooperatively, and (c) to write correctly when creating web pages.

McEwen[31] surveyed 250 National Business Education Association members in USA and found that the most frequently used strategy in teaching software skills is a teacher-centered instruction method that usually involves step-by-step directions to complete tasks [32] viewed that the main purpose of instruction is to prepare students for productive usage of computer skills and solve problems on the job. Teacher should train the students to apply the computer skills they learned to solve realistic business problems. Connick,[33] recommended that telecourses and video remain as viable forms for distance learning programs. Today, computer and multimedia technologies are at the forefront of the distance education phenomenon.

Albrecht and Sack[34] recommended reforms in accounting education in several areas, including IT instruction, to better meet the needs of the accounting profession. They found that accounting professionals and accounting faculty ranked information systems as the second most important topic of study for an accounting major. Accounting students, on other hands, consider IT skills to be the fourth most important after analytical and critical thinking, written communication, and oral communication.

Antonucci and Muehlen[35] concluded that the main objective of the business education is to equip students with skills required for the first job. Employers expect new graduates know the skills used to support their businesses. Fedrowiczi and Hachey[36] found that many faculty members who teach traditional business courses such as accounting, and marketing do not typically have IT training and background. Students also majoring in accounting and marketing may not be inclined in general to IT assignments. Both faculty members and the students must accept that career path in these traditional businesses are inevitable with IT in the organizations.

Naqvi[37] recommended that IT competencies in students should be developed as needed by the business organizations such as word-processing, spreadsheets/graphics and database software. A course in business education is required which includes the basic concepts of IT applications in business and is followed by the introduction of business software such as word-processing, spreadsheets/graphics and databases.

Study sample and data collection process: This study selects four Business Schools from the public and private sector; COMSATS Institute of Technology (CIIT), University of Management and Technology (UMT), University of the Punjab (PU) and Government College University Faisalabad (GCUF). First three Business Schools are located in Lahore while Government College University is included from Faisalabad. The last university is included as a special case due to its different managerial style. GCUF has started Management Sciences Department two years back. A Project Manager along with his office team is appointed to look after the day to day operations. He is responsible to report directly to the Vice Chancellor. The university has currently no policy of hiring full time academic staff. Visiting faculty is hired and the university pays them the rates almost double than the market for their teaching and consultations services.

The study selected sample respondents of 300 students representing the students population in selected universities. Trained interviewers visited the business schools of each university and selected respondents randomly. The required data was collected through a specifically designed questionnaire. The questionnaires were passed to and received simultaneously. Therefore, 271 completed questionnaires out of 300 were easily achieved. The response rate was 90%. Seventeen carelessly filled questionnaires were rejected to further improve the quality and strength of data. Finally, the 254 questionnaires were taken for analysis purposes.

The questionnaire was divided into two parts. The first part contained fifteen attributes to cover various aspects of the effectiveness of IT in business education. The second part consisted on nine recommendations regarding the students suggestions to enhance the effectiveness of IT for business graduates. The attributes were adapted from the relevant literature, personal experience, interviews with various local academicians,

Table 1:Respondents' profile

	Frequency	Percentage
Gender		
Male	205	80.7
Female	49	19.3
No of IT courses attended		
1 course	51	20.1
2 courses	97	38.2
3 courses	54	21.3
more than 3 courses	52	20.5
Qualification		
Master	175	68.9
Bachelor	79	31.1
Previous degree		
Computer Science	67	26.4
Arts	58	22.8
Science	73	28.7
Management Sciences	56	22

and students. In answering the questions, respondents were assured of the confidentiality of their responses and their names were not solicited. All questions were asked on five-point Likert Scale, ranging 1 for not important at all to 5 for most important".

The profiles of the personal characteristics of the sample population are outlined in Table 1. The two groups on gender-based classification are male (80.7%) and females (19.3%). Small representation of females in sample shows the nature of society where males normally join the professional degree programs. Next column shows that 20.1 and 38.2% of the respondents have attended one and two IT related courses respectively. Only 20.5% respondents have attended more than three IT related courses in their degree programs. Almost 68.9% of the respondents are in Master degree while Bachelor degree holders account for 31.1%. Further, 26.4% of the respondents previously hold degree in Computer Science, 22.8% in Arts, 28.7% in Science and 22.0% in Management Sciences. The sample overall represents good representations from all sections of education.

Table 2 presents the results in three subcategories; (1) performance improvement, (2) general usage of IT and (3) specific usage of IT. First category analyzes the improvements in students performance after attending IT courses. Second category covers perceptions of students towards the general usage of IT. The last category relates questions directly relate to students current educational programs. Each attribute is ranked on mean score basis to analyze the results.

Under first category, statement, I start managing things more efficiently after attending IT education (3.87), My communication with public has improved after attending IT education (3.82) rank first and third position while statement IT education has made me more results - oriented and task – focused (3.37) carries twelve position in terms of mean ranking. The results interpret the changing trend in the attitudes of business graduates after attending IT courses. They believe improvement in performance in terms of higher efficiency and improvement in their communication skills. It also improves their knowledge about the subject. However, graduates do not think that they are more task and result oriented after attending IT courses.

Table 1 shows that under second category the statement IT education has increased my ability to use IT resources (3.80) ranks fifth position. Statements IT education helps me to incorporate graphics and visual aids in my daily works (3.30) and IT education helps me to access reading materials of international standard (3.22) rank thirteen and fourteen positions out of fifteen. The results conclude that IT courses improve students abilities to use IT tools. However, they still lack deficiency to incorporate IT tools in their daily works. Graduates also fail to use IT resources to access reading material of international standards.

Table 2: Students perceptions towards the effectiveness of IT in business education

No	Statements	Mean	%	S.D	Sig.	Rank
	Performance Improvement					
1	I start managing things more efficiently after attending IT education	3.87	77.32	1.01	0.00	1
2	My communication with public has improved after attending IT education	3.82	76.46	1.04	0.00	3
3	IT education has increased my general awareness about the course	3.81	76.14	1.02	0.00	4
4	I observe improvement in my works after having IT education	3.56	71.18	0.96	0.00	10
5	IT education has made me more results - oriented and task - focused	3.37	67.32	1.06	0.00	12
General Usage of IT						
6	IT education has increased my ability to use IT resources	3.80	76.06	1.05	0.00	5
7	Now I can save time and cost by using IT resources in my daily life	3.78	75.59	1.05	0.00	7
8	IT education makes me feel more involved in my studies.	3.61	72.28	1.04	0.00	9
9	IT education helps me to incorporate graphics and visual aids in my daily works	3.30	65.91	1.05	0.00	13
10	IT education helps me to access reading materials of international standards	3.22	64.33	1.09	0.00	14
	Specific Usage of IT					
11	I can run many softwares of managerial tasks and strategic decision	3.83	76.54	1.15	0.00	2
12	For financial and statistical analyses, I use softwares	3.80	76.06	1.20	0.00	6
13	I use many types of softwares, which help me to develop marketing programs and plans	3.63	72.52	1.12	0.00	8
14	For accounting procedures, I use number of softwares	3.42	68.43	1.14	0.00	11
15	IT education teaches me to produce high quality assignments	3.20	64.09	1.09	0.00	15

Table 3: ANOVA Test

Question	Gender		Qualification		No of IT courses attended		Previous Degree		Business school attending	
	F value	Sig	F value	Sig	F value	Sig	F value	Sig	F value	Sig
1	0.03	0.86	1.62	0.20	0.89	0.45	1.20	0.31	1.45	0. 232
	0.45	0.51	0.00	0.97	0.56	0.64	3.98	0.01	3.99	0.01
3	0.16	0.69	1.35	0.25	0.31	0.82	2.21	0.09	5.32	0.00
4	0.31	0.58	2.20	0.14	2.58	0.07	2.35	0.07	6.89	0.00
5	0.06	0.81	1.38	0.24	2.86	0.04	1.95	0.12	1.10	0.35
6	0.07	0.80	8.36	0.00	0.63	0.60	1.79	0.15	8.72	0.00
7	2.99	0.09	3.05	0.08	3.20	0.02	3.36	0.02	6.80	0.00
8	0.34	0.56	0.36	0.55	3.12	0.03	2.73	0.04	3.30	0.02
9	0.16	0.69	0.04	0.84	1.75	0.16	1.14	0.34	1.64	0.18
10	0.25	0.62	1.38	0.24	0.02	1.00	5.67	0.00	5.34	0.00
11	0.18	0.67	0.49	0.49	3.62	0.01	4.05	0.01	2.30	0.08
12	0.36	0.55	0.95	0.33	4.18	0.01	1.80	0.15	2.51	0.07
13	1.10	0.30	0.91	0.34	1.41	0.24	1.68	0.17	1.68	0.17
14	0.69	0.41	3.57	0.06	2.42	0.07	1.09	0.35	1.71	0.17
15	0.13	0.72	0.44	0.51	0.76	0.52	2.37	0.07	9.13	0.00

Table 4: Bonferroni Test (Previous Degree Wise Multiple Comparison)

Statements	Subject	Subject	Mean Diff	Significance
My communication with public has improved after attending IT education	Science	Management	-0.60	0.01
Now I can save time and cost by using IT resources in my daily life	Arts	Science	0.51	0.03
IT education makes me feel more involved in my studies	Arts	Science	0.49	0.04
IT education helps me to access reading materials of international standards	Arts	Science	0.76	0.00
I can run many softwares of managerial tasks and strategic decision	IT	Arts	0.57	0.03
		Science	0.52	0.05
		Management	0.60	0.02

* The mean difference is significant at the .05 level.

The last category specific usage of IT concludes that statements I can run many types of software of managerial tasks and strategic decision (3.83), and for financial and statistical analyses, I use softwares (3.80) carry second and sixth positions while statements for accounting procedures, I use number of softwares (3.42) and IT education teaches me to produce high quality assignments (3.20) carry eleventh and fifteenth positions. The results are quite similar to above results in case of general usage of IT. The outcome concludes that graduates fail to use different IT related tools in specialization fields (Accounting, Marketing and Management) of business education. However, business graduates feel some comfortable in using software packages related to Statistic and Finance.

In order to examine the relationship and association between the students preferences and their personal profiles ANOVA Test and Chi-Square Test are applied. The tests cover the variables related to respondents profiles; gender, number of IT courses attended, qualification, previous degree and the university currently attending. The results help us to find significant differences in students perceptions towards the effectiveness of IT in business education. ANOVA results are presented in table 3 while Chi-Square results are presented in the Appendix. Both ANOVA test and Chi-Square tests show the similar results.

The results show that the respondents, regardless of differences in gender and qualification, do not express any significant differences towards most aspects of the effectiveness of IT in business education. The only difference arises in case of IT education has increased my ability to use IT resources (8.36). The next variable no of IT courses attended shows mean differences in case of IT education has made me more results - oriented and task – focused (2.86), IT education makes me feel more involved in my studies (3.12), Now I can save time and cost by using IT resources in my daily life (3.20) and I can run many softwares of managerial tasks and strategic decision (3.62).

Next variable previous degree reports significant mean differences similar to earlier variable no of IT courses attended except in case of my communication with public has improved after attending IT education (3.98) and IT education helps me to access reading materials of international standard (5.67). The outcome may imply that students, who attend more IT courses or have IT degree previously become more focused, cost efficient and result oriented. They are more efficient to run different softwares of managerial tasks. The last variable business school attending registers significant mean differences in eight different attributes which needs further investigations.

Bonferroni test: Bonferroni test is applied to find multiple mean differences among various respondents groups. The test is applied only on the last two variables previous degree and business school currently attending. Results of Bonferroni are presented in Tables 4 and 5.

Table 5: Bonferroni Test (Business Schools Wise Multiple Comparison)

Statements	University Name	University Name	Mean Diff	Significance
My communication with public has improved after attending IT education	CIIT	UMT	-0.54	0.03
		GCUF	-0.62	0.01
IT education has increased my general awareness about the subject	CIIT	GCUF	-0.67	0.00
		P.U	-0.72	0.00
I observe improvement in my works after having IT education	CIIT	GCUF	-0.80	0.00
		P.U	-0.52	0.05
IT education has increased my ability to use IT resources	CIIT	GCUF	-0.50	0.01
		P.U	-0.53	0.02
Now I can save time and cost by using IT resources in my daily life	CIIT	UMT	-0.60	0.01
		GCUF	-0.86	0.00
		P.U	-0.77	0.00
IT education makes me feel more involved in my studies.	CIIT	P.U	-0.67	0.01
IT education helps me to access reading materials of international standards	CIIT	GCUF	-0.81	0.00
IT education teaches me to produce high quality assignments	CIIT	UMT	-0.76	0.00
		GCUF	-1.06	0.00
		P.U	-0.68	0.01

* The mean difference is significant at the .05 level.

Table 4 shows that mean difference appears significant between Science and Management group in case of my communication with public has improved after attending IT education (-0.60). The negative sign indicates that IT improves Management students communication skills more than the Science students. Mean differences are 0.51, 049, and 0.76 in case of statements Now I can save time and cost by using IT resources in my daily life, IT education makes me feel more involved in my studies, and IT education helps me to access reading materials of international standards. All figures appear with positive signs which apply that Arts students are more agreed with the statements than Science background students.

Table 4 also indicates significant mean differences between IT group and remaining groups under I can run many types of software of managerial tasks and strategic decision (0.57, 0.52 and 0.60) respectively. The outcomes show the natural tendency of students whom previous degrees are in IT. They are in better position to understand and use different softwares as compared to students from other groups. The results overall conclude that Science group students need more attention and time to learn IT techniques as compared to other groups.

Table 5 presents multiple comparisons in mean differences at business schools level. It shows significant mean differences between CIIT and UMT and GCUF and between CIIT and PU in case of My communication with public has improved after attending IT education (-0.54 and -0.62), IT education has increased my general awareness about the subject (-0.67 and -0.72), I observe improvement in my works after having IT education (-0.80 and -0.52) and IT education has increased my ability to use IT resources (-0.50 and -0.53). Mean differences appear with negative signs in cases of above mentioned statements. It implies that GCUF and PU students find more improvement in their performances after attending IT education as compared to CIIT students.

Table 5 also shows that significant mean differences between CIIT and the remaining business schools in case of Now I can save time and cost by using IT resources in my daily life (-0.60, -0.86 and -0.77), IT education makes me feel more involved in my studies (-0.67), and IT education helps me to access reading materials of international standard (-0.81). Here again, all values appear with negative signs. The figures conclude that IT improves the educational quality of GCUF students the most while CIIT students are least beneficiary from IT usage.

The students from GCUF and UMT agreed more with the last statement IT education helps me to access reading materials of international standards (-0.76, -1.06 and -0.68) as compared to PU and CIIT. The results overall conclude that GCUF students show the highest mean while CIIT indicate the lowest mean. In other words GCUF students agreed the most and CIIT students are least agreed with the above statements.

The second part of the questionnaire covers recommendations from the students towards the effectiveness of IT in business education. The results are categorized according to mean scores and presented in Table 6.

Table 6 presents the results that have been categorized according to the mean scores that each attribute obtains. Three attribute score more than 4.20 marks in the mean ranking analysis. The findings reveal that students in business schools recommend for Special training workshops should be arranged for IT education followed by I think latest developments should be incorporated in IT education and then I think more resources should be provided for IT education.

The next influential attribute that acquire the mean score more than 4.00 are I think more technology should be used in our program, I think there is need of more IT

Table 6: Respondents Recommendations towards the Effectiveness of IT in Business Education

	Statements	Mean	Percentage
1	Special training workshops should be arranged for IT education	4.30	85.98
2	I think latest developments should be incorporated in IT education	4.28	85.51
3	I think more resources should be provided for IT education	4.24	84.72
4	I think more practical issues should be incorporated in IT education	4.20	84.02
5	I think more technology should be used in our program	4.19	83.70
6	I think there is need of more IT related education in our program.	4.13	82.52
7	I think experienced person of corporate background should teach IT education	4.07	81.42
8	I think IT related internship should be included as a part of program	3.85	77.01
9	I think foreign qualified faculty should be recruited in IT education	3.81	76.14

related education in our program, and I think experienced person of corporate background should teach IT education. The findings interpret the students are more interested to include new IT related courses and programs as part of their course. They do not consider hiring corporate personal to teach them. The last two factors, which students consider least important score mean values less than 4.0. These factors are I think IT related internship should be included as a part of program and I think foreign qualified faculty should be recruited in IT education.

Overall results conclude that students are more interested to include the core and practical issues as part of curriculum rather than hiring foreign qualified faculty. Students also do not consider including IT internship as part of their management degree. They consider IT related subjects only as supporting subjects and want to focus on the core specialized fields of business education.

CONCLUSIONS

This study examines the effectiveness of IT in Business education. It selects four different universities from Pakistan and collects the business graduates perceptions and recommendations towards the role of IT in their studies. Theoretical evidences based on literature review suggest that IT plays a vital role in modern education. A resource person can enhance the effectiveness of lecture by using both the technology and face to face teaching methodologies in the classroom. Similarly, the industrial sector also expects the fresh graduates to equip up with skills required to support their businesses.

The study concludes that IT has improved the performance of graduates but mostly in general usage of computers. Graduates feel deficiency in specific usage of computer related to different specialized areas of business education such as Finance and Marketing. Graduates recommend including more practical issues and updated technology in their curriculum. Simple hiring of foreign qualified faculty is not their preferences.

The study also find that the students of GCUF are more satisfied with the improvement in their performances after attending IT courses as compared to other universities students. GCUF as mentioned earlier do not have the policy of hiring permanent faculty. The university pays the visiting faculty the highest most rates for their teaching and consultation services. However, pros and corns of hiring permanent faculty verses visiting faculty needs separate research and discussion.

Technology and technological applications are, indeed, a continuous process which need resources beyond academes reach, is always a long and laborious process. Universities in Pakistan are currently lack required resources in terms of computer labs, multimedia and high speed internet. The need is to give more practical demonstration to the students while fully utilizing the available resources. Further, faculty should also be fully motivated and properly monitored towards the usage of information technology in the classrooms.

Table A: Chi Square Test

	Gender		No of It courses attended		Qualification		Previous Degree		Business School attending	
Question	Chi-sq	Sig	Chi-sq	Sig	Chi-sq	Sig	Chi-sq	Sig	Chi-sq	Sig
1	0.12	0.73	2.19	0.53	0.52	0.47	5.59	0.13	11.39	0.01
2	0.00	0.96	2.53	0.47	6.77	0.01	3.28	0.35	21.96	0.00
3	0.12	0.73	10.36	0.02	0.42	0.52	7.87	0.05	8.19	0.04
4	0.00	0.97	9.93	0.02	1.43	0.23	5.26	0.15	2.79	0.43
5	0.23	0.63	0.28	0.96	1.32	0.25	16.05	0.00	15.23	0.00
6	0.14	0.71	3.35	0.34	0.22	0.64	4.80	0.19	18.41	0.00
7	0.08	0.78	6.69	0.08	0.14	0.71	3.14	0.37	4.35	0.23
8	0.66	0.42	1.02	0.80	0.00	0.98	9.78	0.02	10.50	0.02
9	2.13	0.14	12.51	0.01	1.90	0.17	7.72	0.05	16.27	0.00
10	0.49	0.49	10.12	0.02	2.81	0.09	5.54	0.14	14.86	0.00
11	0.01	0.94	2.61	0.46	1.25	0.26	2.55	0.47	3.02	0.39
12	0.24	0.63	11.25	0.01	0.24	0.63	12.03	0.01	6.37	0.10
13	1.30	0.26	4.94	0.18	1.05	0.31	4.59	0.20	4.36	0.23
14	0.70	0.40	6.34	0.10	3.05	0.07	3.44	0.33	6.80	0.08
15	0.36	0.55	12.29	0.01	1.05	0.31	5.44	0.14	8.44	0.04

Regularly feed back from students is one of the options. This can bring us closer to identify factors which influence students perceptions towards the effectiveness of IT and reasons of negative perceptions, if any. Changes in curriculum may also being considered to address the changing needs of graduates attending higher educational institutions and as a reflection of the market demand.

Universities also need to find new ways to fund such efforts. Huge literature on university-industry collaboration is available. However, this discussion is beyond the scope of this study. Lastly, the idea of this study can be replicated in other disciplines.

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