

THE ROLE OF TECHNICAL AND GENERAL EDUCATION IN HUMAN RESOURCE DEVELOPMENT

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ABSTRACT-The study was aimed at investigating the role of general and technical education in Human Resources Development in Pakistan. Data was collected from 13 Universities/UETs/UCETs/DAIs functioning in both public and private sector of Multan. Statistics of past five years i.e. 2011-2015 for students' enrollment, pass out and graduate placement were collected from official websites of all the sampling universities/UETs UCETs/DAIs and Higher Education Commission (HEC) of Pakistan. However, rate of graduate placement was used as benchmark for making comparison of both the types of institutes. Chi-Square Test (χ^2 -test) was applied to measure the impact of Engineering and Technology and General education on HRD while t-test was applied to compare the role of Engineering and Technology and General education in HRD in Pakistan. Results of Chi-Square Test (χ^2 -test) revealed that engineering and technology education had significant positive impact on HRD whereas general education had no significant impact on HRD in Pakistan. The results of t-test revealed a significant difference between the impact of technology education and general education on Human Resource Development (HRD) in Pakistan.

Key words: HRD, Chi-Square test, Graduate placement, Education enrolment.

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1.INTRODUCTION

No nation can survive in global community without providing quality and modern education to its citizens. It is considered as the bases for nation building and become the source of prosperity. Education is the most important contributor in human resource development of nation. It creates opportunities for the society which are socially and economically deprived sections. Education can either be general education covering social sciences, business & economics, basic sciences or it can be technical education including engineering, technology or medicine.

Education is a planned effort intended to bring change in the aggregate behavior of individuals and society at large (Bilal, 2013). It enables individuals to adjust themselves in the dynamics of the contemporary society. It intends to transmit social values to the coming generation so that they may be able to become the active participants of the social circle. This process of social adjustment takes place in the institutions of family, social circles and educational institutions. According to Oxford Advanced Learner's Dictionary (2000), education is a process of teaching, training and learning, to improve knowledge and develop social skills, especially in schools or colleges. Okafor (1984) defines education, a process through which individual helped to attain the development of all his potentialities and their maximum activation and to achieve his perfect self fulfillment. Thus from the above definitions, it is quite clear that education prepares an individual to make social adjustment in society.

Allama Iqbal and Russell said that "Technical education destroys fellow feelings". Therefore, both they suggest that technical and general education should be imparted to the students at the same time. Technical education helps to learn the new technologies and development of human resource as well as general education

help to learn the social values. Technical education teaches us how to make living?

General education teaches us how to live?

Technical education is very essential in these days. We use technologies everywhere like in factories, on farms, on roads and in offices etc. to look after these technologies we need technicians. The good technicians and scientists without technical education are not possible. Unfortunately, a mainstream of our colleges and universities are producing nontechnical human resource and also students are busy in receiving education in languages, literature, social sciences and arts subjects.

General education makes them men of ideas not men of technique and skill. Our human resource wish to become high-placed government servants but such jobs is limited. Our colleges and universities through general education are producing clerks. To stay alive and for a worthy position among the nations, we will have to implement ourselves to the supplies of the time.

Asian countries including Pakistan are becoming industrial now a day more and more. Now we also started making cars, heavy machines, missiles and war weapons ourselves by using old technologies and with old technicians. Our human resource is not well developed and equipped with new technologies and technical education for the future through industrial technology. To uproot poverty and unemployment is to spread technical education than general education in every nook and corner of the country.

Technical work force of a country is considered as human resource. According to F.H Harbison and Myers "HRD is the process of acquiring and increasing the number of person who have the technical skills. Technical education and experience is critical for the human resource development of a country. Human capital formation is associated with investment in man. The human development is a

creative and productive resource of the country". Trained and technologically developed people are called human resource. From research it is clear that other factors of development without human resource become ineffective.

Human resource development is a long, technical and continuing process. According to H.L Verna and M.C George "defined that HRD is the process of increasing the technical knowledge, skills and the capabilities of the people". According to Prof. J.D.Sethi "HRD is the process of development through which maximum utilization of existing human capabilities, intellectual and technological new ones is taken."

1.Objective of study

The objective of this study was to highlight the importance of technical education as compare to general education, particularly for human resource development in Pakistan. This study specially reviewed and analyzed the status of technical and general education related policies and practices and their impact on development of human resource in Pakistan.

Following are the specific objectives of the study.

1. To investigate the impact of general education on HRD in Pakistan.
2. To investigate the impact of technical education on HRD in Pakistan.
3. To compare the impact of general and technical education on HRD in Pakistan

2.LITERATURE REVIEW

The researcher specifically reviewed and analyzed the status of technical education, related policies and practices and their impact on development of human resource in Pakistan. Additionally, it looks at overall technical education needs and assesses the existing gaps in meeting the national economics goals, and thus

formulates policy recommendations for a successful and resourceful technical education program to meet the new challenges and for prosperous economic growth.

The role of technical and general education in human resource development is a very vital. Different researcher's state that nation and the countries only developed by getting not only general education but also there is a need of technical education for prospers growth and development (Abbas, Saeed, 2005). As technology is a branch of knowledge that deals with the creation and it is by the use of technical means and their interrelation with life. Technology draws upon subjects such as industrial arts, applied science, engineering etc (Awang, 2004). Human Resource Development is process of learning, training, developing and educating the employees. HRD was initially set up for training and development of the employees. HRD help the employers in crafts such as electricians, or engineers as an example and from this they would learn from their masters and will develop their skills to become able to perform in the workplace bitterly. This is why technical education is so important for HRD. Because the aim of HRD is to learn, train, develop and educate people. The training in general and technical skills development in particular play a vital role in individual, organizational and overall in national economic growth and play a central part in Human Resource Development (HRD). Technical education facilitates individuals to learn and earn more money. The demand day by day rises for vocationally trained and technically educated human resource with every step towards industrialization and transformation of invention units. Education and technical training are the key variables of human resource development to examine the government expenditure on education and training, years of schooling, number of enrolment and level of education of the technical workforce (Awang, 2004). If Pakistan need to boost up their economy under the competitive conditions of the

global economy, then it must move into more technical education based workforce and products where global growth is concentrated. Without trained and technical manpower the producers would make stop-gap arrangements which will lead to sub-optimal decisions and low levels of productivity (Kemal, 2005). The role of technical education in building the efficient and effective labor workforce is well predictable. The human resource development in youth with the help of better schooling is important determinant of long-run economic growth. Persistently and consistently it is found that schooling is helpful to enhance productivity and individuals earning (Afzal et al, 2010). Heckman (2005) says economic performance will be enhanced by equalizing returns across all types of investments like physical and human. The economic performance will reduce regional inequalities in access to technical education and it depends upon educational decisions on the income of parents. Human capital has a high rate of return. Human resource development through technical education has been identified as a key determinant of comparative advantage and manufacturing export performance (Hussain, 2005). The development in most advanced areas such as transportation, telecommunication, material resources and pharmaceuticals etc., is based on technical education. We can say that technical education is omnipresent and universal in today's world (ALI et al, 2014). Fedderke (2005) says the technological progress may come to be the most important long-run driver of economic growth, in the long-run this source of human capital's impact on growth is the most invariant. Hanushek (2013) says that the role of technical skills in promoting economic growth provides an explanation for the uncertain influence of human capital on growth. The impact of human resource development becomes strong when the focus turns to the role of school education. The size of change needed

makes clear that closing the economic gap with developed countries will require major structural changes in schooling institutions and education.

The effect of greater supplies of human resource is to lower the technical skill quality and difference. However more developed human resource generates more innovations, which in turn increase the demand for technical workers to absorb new technologies into production (Theo 2000). Human Resource Development (HRD) activities reflected through increase in GNP and overall productive activities in industrially developed countries in twentieth century. Education is as natural right as the right to breathe (Rena, 2006). The basic purpose of technical education is to contribute for the national development which is possible by producing technical graduates and creating a civil society with a decent leadership quality. Then it will help a country to sustain the challenges of the future (Alam & Shahjamal, 2008). The countries which have achieved sustainable development give a high priority to technical education in formulating education policy. This research tells that the population is required to provide technical education with some revision of education policy to ensure the sustainable development. Science and technology are highly recognized to both the origins of sustainability challenges and to the prospects for successfully (Alam, 2009). Hallak (1990) argues that technical education is also linked to human resources development and this has an impact on economic growth, but also an impact on the wider development of individuals and societies. Nowadays top business and national leaders fully realize the power of technical tools and education for reaching business targets and economic growth. The utilization of technical tools and education helps not only to fulfill defined company's goals but also to optimize the manufacturing progress as well. Human Resources Development (HRD) must aim to achieve the competitiveness of the company in the field of HR by

means of providing constant educational and technical training programs for personal development of employees.

Experts suggest that one of the biggest impact of technical education on human resource development comes from the way that technology alters industries and lifestyles (Selvan, 2015). The technical education has an impact on most aspects of our lives, in economic activities, education, entertainment, communication, travel, etc. The technologies have been a large extant to developed in cultural and social norms in a small number of developed countries (Davison et al, 2000). Now-a-days human resource development has become one of the major issues of present world. Human resource development is very important for economic development as well as overall development of a country. Human resource development has been an important issue in the socio-economic arena. Human resource is the most important asset for any country. A country may become able to develop in every sector only by developing its human resources. There is an important ingredient for the development of human resources is education; the education must meet the requirement of modern society and the demand of global market (Akhter, 2015). Education and human resource development is also an important factor in this geographic region of the world to develop economic growth for influencing changes in economic structure.

3.RESEARCH METODOLOGY

3.1 Research Design

The research of the study has been designed that it will help to investigate the performance and impact of technical and general education on Human Resource Development in Pakistan. The area of the study is consisting of Province Punjab-Pakistan due to convenience sampling.

3.2 Population of Research

The population of the current study is consisted of all the general education graduates and technology students in the public and private universities of Pakistan. All the formal universities and engineering universities and technology collages of Pakistan are the population of the study. Details of population are under;

Table 1: Population Group

Type of Universities	Degree Awarding Institutes	Degree Awarding Technology Institutes	Total
Public	84	20	104
Private	60	15	75
Total	144	35	179

Source: HEC, 2017

In Pakistan there are total (179) degree awarding institutions and institutions which award the degrees of general education like in social sciences and other language programs are (104) recognized by the HEC in which 84 are public and 60 are private. Other 35 universities are engineering & technology awarding institutions in Pakistan which are also recognized by the HEC in which public are 20 and 15 are private.

3.3. Sample of study

By the definition, sample is a group represnting the attributes of the entire population. As the number of universities of formal education and technology universities and colleges are scattered and large in numbers, it was hardly possible for the researcher to reach every respondent. Thus study sample was clustered to formal education universities and technology universities and colleges of public sector and private

sector of Multan using convenience sampling. The list and data of general education and technical education universities and colleges are taken from internet and official websites of universities of Multan to compare them. Similarly, to compare students which have got secured jobs after getting formal degree education and technology education is also taken from websites.

3.4 Sample size

Table 2: Sample UETs/UCETs/DAIs (N=13)

Type of Universities	Name of Universities	Students Enrolled (2011 to 2015)	Students Passed (2011 to 2015)	Students Placed
Degree Awarding Technology Institutes of Multan	NFC Institute of Engineering and Technology Multan	1510	1359	970
	Public Muhammad Nawaz Sharif University of Engineering and Technology Multan	1200	*Newly Established	**N/A

		UCET, Bahaudin Zakriya University Multan	1215	1093	875
	Private	Institute of Southern Punjab Multan	1000	600	480
Degree Awarding Institutes of Multan	Private	NCBA& E Multan	900	769	437
		Institute of Southern Punjab Multan	800	697	482
	Public	Bahaudin Zakriya University Multan	11200	8960	5376
		The Woman University Multan	2400	1870	1180
		University of Education, Multan	2200	1760	1056

	NUML Multan	1600	1320	850
	Air University Multan	1200	1080	612
	AIOU, Multan Campus	2600	*N/A	*N/A
	VU, Multan Campus	**No Record Found	**N/A	**N/A

Source: Electronic data from Websites of Universities

* Newly established UET/DAI

** Being newly established UET/DAI, now student session of it has been passed out yet

3.5 Source of Data

Secondary data was collected from official websites and data bases of the sampled institutes. For ease of access and convenience data of graduates of general education and technical education graduates and job place (who have secured job) is collected for the purpose of analyses. Statistics of the universities is collected from official websites.

3.6 Period of study

The period of study consists of five years starting from 2011 to 2015. The secondary data of the universities relating to this period have been included in this study. The reason for selecting this period is that to compare the impact of technical and general

education in human resource development in Pakistan for further assessment of the future.

3.7 Analytical Techniques

Data was analyzed by comparing means of general education graduates and technical education graduates. Since the study measured the responses of two types of education, independent sample, Chi-square test and t-test were applied to ascertain the group differences. Authors applied descriptive statistics to measure the role of general education and technical education in HRD in Pakistan.

4.DATA ANALYSIS

The 1st objective of the study was to investigate the role of general education in HRD in Pakistan. This objective led to the research question, “what is the role of general education in HRD in Pakistan?” To answer this question, the researcher developed one hypothesis (Ho1) and tested using Chi-Square test (χ^2 -test).

The 2nd objective of the study was to investigate the role of technical education in HRD in Pakistan. This objective led to the research question, “what is the role of technical education in HRD in Pakistan?” To answer this question, one hypothesis (Ho2) was developed and tested using independent sample χ^2 -test.

The 3rd objective of the study was to compare the role of general education and technical education in HRD in Pakistan. To answer this question, one hypothesis (Ho3) was developed and tested using independent sample t-test. HRD was measured by rate of placement of graduates from both the types of universities.

Table below presents the details of sampled general education Universities/DAIs operating in Multan District of Punjab Province.

Table 3: UETs/UCETs/DAIs of Multan

Type of University/DAI	Name of Universities	Students Enrolled (2011 to 2015)	Students Passed (2011 to 2015)	Students Placed
Public	NFC Institute of Engineering and Technology Multan	1510	1359	970
	Nawaz Sharif UET Multan	1200	*Newly Established	**N/A
	UCET, Bahaudin Zakriya University Multan	1215	1093	875
Private	ISP Multan	1000	600	480

Source; Electronic data from Websites of Universities, 2017

* Newly established UET/DAI

** Being newly established UET/DAI, now student session of it has been passed out yet

Table 4: Universities/DAIs of General Education in Multan

Type of Universities /DAI	Name of Universities	Students Enrolled (2011 to 2015)	Students Passed (2011 to 2015)	Students Placed
Public	Bahaudin Zakriya University Multan	11200	8960	5376
	The Woman University Multan	2400	1870	1180
	University of Education, Multan	2200	1760	1056
	NUML Multan	1600	1320	850
	Air University Multan	1200	1080	612
	AIOU, Multan Campus	2600	*N/A	*N/A
	VU, Multan Campus	**No Record Found	**N/A	**N/A

Private	Institute of Southern Punjab Multan	800	697	482
	NCBA& E Multan	900	769	437

Source; Electronic Data from Websites of University, 2017

* No statistics were available for the placement of students of AIOU, Multan Campus

** No record found for the enrollment and placement of students of VU, Multan Campus

Table 4 shows that a total of 7 public sector universities/Campuses/DAIs operating in Multan. While only 2 private sectors DAIs were functioning in the city. Details of enrollment and placement of graduates of both the types of institutes have been discussed as follows.

Table 5 : Comparison of Public and Private Sector UETs/UCETs/DAIs

Institute Type	Students Enrolled (2011 to 2015)	Students Passed (2011 to 2015)	Students Placed
Public	2725	2452	1845
Private	800	600	480

Source: Author

Table 6 : Comparison of Public and Private Sector General Education Universities/DAIs

Institute Type	Students Enrolled (2011 to 2015)	Students Passed (2011 to 2015)	Students Placed
Public	18600	14990	9074
Private	1700	1466	919

Source: Author

4.1 HYPOTHESIS TESTING

The researcher has made an inferential analysis of the statistics of both the type of institutes to test the hypotheses of the study.

Ho1: Technology education has negative impact of the Human Resource Development (HRD) in Pakistan.

Table 7: χ^2 -test on mean score of UETs/UCETs/DAIs

N	Mean	SD	χ^2 -test Value	P Value
3525	775.00	259.85	5.957	.03

Source: Author

$P=0.03 < 0.05$ (2, $N=3525$, Mean=775.0) at table 4.5 clearly shows that Engineering and Technology education has significant impact on the Human Resource Development (HRD) in Pakistan.

Ho2: General education has negative impact of the Human Resource Development (HRD) in Pakistan.

Table 8: χ^2 -test on mean score of Universities/DAIs of general education

N	Mean	SD	χ^2 -test Value	P Value
20300	1427.3	1763.68	1.893	.127

Source; Author

$P=0.127 > 0.05$ (2, $N=20300$, Mean=1427.3) at table 4.6 clearly shows that general education has no significant impact on the Human Resource Development (HRD) in Pakistan.

Ho3: There is no significant difference between the impact of technology education and general education on Human Resource Development (HRD) in Pakistan.

Table 9: t-Test on Mean Difference Placement of General and Technology Education

Respondent Type	N	Mean	SD	T-Test Value	P Value
General Education	20300	1427.57	1763.68	3.617	.03
Technology Education	3525	775.00	259.85		

Source; Author

$P=0.03 < 0.05$ at table 4.7 above shows a significant difference between impact of technology education and general education on Human Resource Development (HRD). Hence the null hypothesis stating “There is no significant difference between the impact of technology education and general education on Human Resource Development (HRD) in Pakistan)” is rejected.

Table 10 : Summary of Results

Hypothesis	Statement	Reason	Results
Ho1	Engineering and Technology Education has negative impact of the Human Resource Development (HRD) in Pakistan.	$P=0.03 < 0.05$ (2, N=3525, Mean=775.0)	Rejected
Ho2	General Education has negative impact of the Human Resource Development (HRD) in Pakistan.	$P=0.127 > 0.05$ (2, N=20300, Mean=1427.3)	Accepted
Ho3	There is no significant difference between the impact of technology education and general education on Human Resource Development (HRD) in Pakistan.	$P=0.03 < 0.05$	Rejected

5.FINDINGS AND RESULTS

Some of the major findings of the study have been presented as follows;

1.The study revealed that pass out rate of public sector UETs/UCETs/DAIs was 90% while it was 75% in case of private sector UETs/UCETs/DAIs.

2.It was also found that placement rate of public sector UETs/UCETs/DAIs was 64% while it was 60% in case of private sector UETs/UCETs/DAIs.

3.The study revealed that that pass out rate of public sector universities/DAIs of general education was 81%% while it was 86% in case of private sector universities/DAIs.

4.It was also found that placement rate of public sector universities/DAIs of general education was 49% while it was 54% in case of private sector universities/DAIs of general education.

5.The study showed that placement rate of public sector UETs/UCETs/DAIs was higher (64%) than that of private sector UETs/UCETs/DAIs (60%) in Pakistan. Similarly, placement rate of private sector universities/DAIs was higher (54%) than that of public sector universities/DAIs (49%) in Pakistan. However, the difference of placement rate of both public and private institutes was not significant.

6.The study revealed that engineering and technology education had significant positive impact on HRD in Pakistan.

7.It was also found from results of Chi-Square Test (χ^2 -test) that general education had no significant impact on HRD in Pakistan.

8.Finally, it is quite clear that that placement rate (62%) of UETs/UCETs/DAIs was higher than that of universities/DAIs of general education which was 51.5%. This was also supported by the results of Chi-Square Test (χ^2 -test) which showed a

significant difference between the placement rate of UETs/UCETs/DAIs and universities/DAIs of general education.

6.CONCLUSIONS AND RECOMMENDATIONS

On the basis of the findings of the study following conclusions were drawn;

► Findings of the study led us to conclude that pass out rate of engineering and technology graduates at public sector UETs/UCETs/DAIs was higher as compared to the students' pass out rate of private sector UETs/UCETs/DAIs. The same was the case for placement rate of both types of institutes. Employers prefer to hire public sector UETs/UCETs/DAIs' graduates as compared to the private sector UETs/UCETs/DAIs.

► It was also noted that pass out rate of private sector universities/DAIs of general education was higher as compared to the students' pass out rate of private sector universities/DAIs of general education. Interestingly, placement rate of private sector universities/DAIs of general education was higher than that of public universities/DAIs.

► It was also noted that placement rate of UETs/UCETs/DAIs was far higher than that of universities/DAIs of general education. This also led us to further conclusion that engineering and technology education promises more opportunities of growth as compared to general education.

In view of the findings of the study, it was recommended that;

- As it was evident from the findings of the technical education has higher placement ratio as compared to general education, policy makers may focus on the provision of technical education to the citizens of the country. More funds may be allocated for this purpose in national budget.

- In view of the higher placement rate of technical and engineering graduates in national and international job market, state government may establish more technical and engineering education institutions.
- Although the findings of the study suggest that technical education has higher prospects of placement as compare to general education, however, general education should also be given equal importance as it provides workforce for social needs of a society. A balance is needed in this regard.
- In view of the findings of the study, organizations may offer internships and training opportunities to the general education graduates to prepare a skilled pool for their future needs. Government may support and finance private sector for this purpose.
- State government may establish more and more vocational centers to make the workforce more skilled which may be able to capture international job market.

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Appendix

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Institute of Southern Punjab Multan	www.isp.edu.pk	info@isp.edu.pk
Bahaudin Zakriya University Multan	www.bzu.edu.pk	uce@bzu.edu.pk
The Woman University Multan	www.wum.edu.pk	N/A
University of Education, Multan	www.ue.edu.pk	N/A
NUML Multan	www.multan.numl.edu.pk	Inf-mtn@numl.edu.pk
Air University Multan	www.aumc.edu.pk	N/A

AIOU, Multan Campus	www.aiou.edu.pk	Rd_multan@aiou.edu.pk
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Higher Education Commission	www.hec.gov.pk	N/A

Authors' contribution/Conflict of interest

This research work was carried out in collaboration between two authors. Author AGA designed the study, performed statistical analysis, wrote protocol and edited final draft of the manuscript. Author GMM collected data, analyses of the study, conducted literature review, and prepared first draft. Both authors read and approved the final manuscript. They declared no conflict of interest with any person or institution.
