

LEVEL OF EDUCATION AND FIELD OF SPECIALIZATION: AS CONTRIBUTOR TO DURATION OF UNEMPLOYMENT AMONG UNIVERSITY GRADUATES

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DOI: <https://doi.org/10.5281/zenodo.16992804>

Keywords

Unemployment, Kaplan Meier, Mantel-Cox, Survival function

Article History

Received on 28 May 2025

Accepted on 03 August 2025

Published on 29 August 2025

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Abstract

The study was design to calculate waiting time of employment for graduate in KP Pakistan with respect to level of education and specialization in field. Through multi-stage non-probability sampling responses of 991 respondents were collected who have graduated during 2013 to 2024. The well-known Kaplan Meier method were used to estimate the duration of unemployment for graduates and mantel-Cox test is used to compare duration of unemployment with respect to Specialization and level of degree.

The waiting time for computer graduates is 22 months to be employed. The minimum waiting time, of 12 months for agricultural Sciences, Pure applied Science and Medical Sciences graduates, while maximum 36 months for Management sciences graduates, to be employed after completion of final degree during the period 2013-2024. The waiting time varies across the specialization. Graduates of management sciences, engineering and law are top ranked specializations on waiting time for employment. This can be contributed to saturation in field and lack of job opportunities in these particular fields of study. Medical science, agriculture science and pure and applied science students have less waiting time to be employed. It has also been found out through this research study that increase in level (Bachelor-PhD) of education decrease the unemployment time for graduates of all fields.

The study can recommend the development of integrated frame work for information about trends of unemployment, career counseling and elimination of unemployment at national level

INTRODUCTION

The phenomenon of unemployment takes the shape of a problem when it takes too long for a graduate to become employed generally and particularly in underdeveloped economies. Hence it becomes imperative to determine exact duration time for graduates of different fields before they become employed. This issue has also become prominent in

Pakistan due to the fact that the reaching an historical high of 8.27 percent in December of 2002 and a record low of 3.13 percent in December population of Pakistan is growing annually at the rate of 2% while currently being 184.35 million out of which 32% is the part of the labor force in Pakistan. Labor Force Survey data shows that total labor force participation

(LFP) rate increased slightly from 32% in 2nd quarter of 2010-11 to 32.1% during 3rd quarter 2012-13. The male LFP rate has increased from 48.6% in 2010-11 to 49.1% in 2012-13, while female LFP rate has decreased slightly from 4.8% to 14.3% for the same period. The available statistics indicate that labor force is increasing whereas capacity of the economy is not expanding with the pace of labor force. Therefore unemployment is on rise and low wage informal sector is expanding (see Labor Force Surveys, 2009). The research study conducted by Gonzalo and Saarela (2000) took into account both gender and age factors in calculating the unemployment reasons in Finland. As no such study has been conducted in Pakistan striving to calculate duration of unemployment and underemployment therefore this study will let the government and policy makers to calculate the duration of unemployment and underemployment KP graduates after completion of their final degree. This study aims to determine the duration of unemployment experienced by university graduates in Khyber Pakhtunkhwa (KP) Pakistan after completion of their final degree with respect to field of specialization and level of education. \

LITERATURE REVIEW

The theoretical foundation of this study develops from the concept of unemployment as in this study an attempt has been made to measure the duration of unemployment of university graduates with respect to their field of specialization and level of education. A significant amount of literature is available making an attempt to address the issues pertaining to unemployment which depicts the importance of this topic all across the globe. Overall a critical review of the literature has been provided in this section.

Hou (2011) in his policy research study strived to define unemployment from the perspective of Pakistan through referring to the Pakistan Labor Force Survey (LFS) according to which, employed is defined as anyone who is significantly involved in any job for pay, profit or family gains during the past one week, or for at least one hour during a day or provided assistance services in family businesses or family farms during the past week. This comprehensive definition provided by LFS also encompasses those as employed who have not been working during the past week but have a job or enterprise or a business. Consequently,

LFS attempts to define an unemployed as anyone has not been engaged in any of the above mentioned activities but was available for work currently as well as during the past week.

The concept of the duration of unemployment describes the measure of the averages amount of time that people find themselves unemployed or underemployed (Boyes & Melvin, 2007). Even though the existing literature suggests that time is one of the essential factors that determine the status of unemployment and underemployment, in most instances, this duration is, in most cases, longer than a duration of four weeks within which a person is said to be categorized as unemployed. In this way the concept of time is extended, as a concept of duration, to which there is a special analysis of duration. The issue of long-term unemployment has raised issues of national concern since it adds to the economic burdens to the nation as well as the social burdens of the country (Haynes et al., 2011). These economic and social costs are attributable to the unproductive time period spent by the labor force when unemployed. These economic and social costs become noteworthy when considered in the context of unemployed individuals as such cost tend to put momentous pressures on the families and communities and could not be absorbed by these entities without major dislocation (Moffitt, 2024).

Within the perspective of duration analysis for unemployment, Survival analysis is found out to be a popular technique (Min, 2025). The concept of survival analysis frequently prevails within the domain of medicine; however recent years have seen an increase in its use for modeling unemployment specifically from the social science perspective.

Moffitt (1999) used a mix of methodological tools to analyze the labor market and also provided innovation in the econometric analysis of the dynamics of employment. Similarly, Tansel and Tasci (2005) used both parametric and non-parametric tests to answer the question of what determines unemployment in Turkey. The D'Agostino and Mealli (2000) found that there is mixed results of unemployment in some European countries by using Cox proportional hazards. Kavkler et al. (2009) studied five Eastern and Central European countries and used a semi-parametric Cox regression method. In particular, the analysis was carried out using Cox proportional

hazard models with time-dependent variables. Alkafri (2011) framed the unemployment duration of male and female workforce in Middle East countries and Palestine through the use of Labor Force Quarterly Survey data for 1996-2008 and a twofold method was applied including descriptive and Probit regression analysis with a transition probability matrix.

This study categorized nature of job and the attached fringe benefits as the factors affecting the duration of unemployment. The researcher focused on the preference for fringe benefits and better working conditions by unemployed people in seeking public sector jobs rather than to have higher salaries (Wang, *et al.*, 2024). Large queues for public sector jobs in Pakistan were due to the reason that unemployed prefer them which in turns elongate their duration of unemployment, keeping the education and other factors constant. Sackey and Osei (2006) inquired about course and determinants of unemployment and underemployment duration from the aspect of human resource underutilization in Ghana. The former dominated in urban areas and later was found extensively prevailing in rural areas. Specifically the poor industries came up with higher rate of underemployment. Education, demographics, size of firm and the type of employment were identified as important factors of unemployment and underemployment. The factors identified by these studies and several other studies are taken up in detail in the preceding sections.

In countries like Belgium, Denmark, France, Greece, Spain, and Portugal women have lower chances of leaving unemployment (D'Agostino and Mealli, 2000). These findings are further strengthened by those of Danacica and Bauce (2006), which claim that in Romania women tend to have smaller unemployment duration than men. Same conclusions were drawn by Tansel and Tasci (2005) for Turkey and Stetsenko (2003) for Kyiv.

The significance of educational level in determining the duration of unemployment can be evaluated through the fact that in the current developments higher education is considered important not merely to seek knowledge and wisdom, but also to acquire skills that are necessary for getting good job (Altindag, *et al.*, 2022). Moreover it is also deemed necessary for preparing the individuals according to the requirements of future job employers Dahri (2009).

Many authors have considered the impact education level on the time duration of unemployment. Ollikainen (2003) argued that higher education is a significant factor in curbing unemployment, especially within women. Kettunen (1997) clarified that the significance of education is there at the foundational stages of a career, however for those with significant experience the relationship turns negative. Their conclusions are based on the figures that unemployed Finnish workers possessing 13 -14 years of education had the highest re-employment probability. D'Agostino and Mealli (2000) also reported that education decreased unemployment duration in the UK, Belgium, and Ireland whereas no significant changes were found in Greece and Spain. These results are substantiated by Serneels (2001) who found that education has positive impact in reducing unemployment durations. On the same line of argument, Domadenik and Pastore (2004) in their study conducted using multinomial logit model showed that tertiary education on young adults is a safeguard against unemployment. Kavkler *et al.* (2009) also found out that more education meant reduced unemployment duration among countries in Central and Eastern Europe. Further evidence of the relationship between education and decreased risk of unemployment were found by Ollikainen (2003).

The length of unemployment is also dependent on specialization field. For example, Thor (2008) discussed the length of time spent unemployed by recently graduated non-Western minorities in the Dutch labor market, by looking at their approaches to finding a job. The researchers concluded that efficient job search strategies decreased the length of unemployment greatly, with internships being more effective than using the services of public employment offices in helping young entrants in the workforce to secure employment. Race, gender, educational degree, field and region of graduation and year of participation to survey were found significant explanatory variables to determine the job search method that is more successful among others.

Battu *et al.*, (2010) examined the methods of job finding for different ethnic groups in UK by using the data from UK Quarterly Labor Force Survey. Their findings suggested that the most popular method for finding a job was through personal networks for the ethnic minorities, those born in foreign and those

who consider themselves to be non-British. These groups were found to be ineffective mostly in terms of getting jobs or the levels of employment achieved. There were found significant differences across most of the ethnic groups with some of them losing excessively by use of personal networks. The informal search methods were mostly used by the less educated ethnic unemployed workers due to which they had lesser chances of employment as compared to whites and the more educated workers who used the formal search methods. Effects of adjustment to the culture were evident with those born in foreign and the ethnic groups with non-British identities were mostly expected to use personal networks. As the stay in UK was prolonged, there was a greater shift to the direct approaches towards employers.

The literature reveals that there is a time frame that a person remains unemployed and this is often considered to be the duration of unemployment. This duration can, however, vary, depending on various factors previously identified. These most recognized determinants are the level of education and the area of specialization. However, evidence among countries does not imply the same trend, instead they show disparities depending on the circumstances and situation. This dichotomy explains the need to consider these factors within the context of the socio-economic setting of Pakistan and especially when examining the phenomena of unemployment and underemployment.

The objective of the study are stated below,

1. To calculate the duration of unemployment with reference to degree of specialization.
2. To calculate the duration of unemployment with regard to level of education.

RESEARCH METHODOLOGY

(Intro) Calculations of time from graduation to work, variation in time of unemployment with reference to field of specialization and level of education on this time were the major objectives of study, to fulfill that universe for study was consider HEC recognized

universities and degree awarding institutions working in KP. The criteria for selection of unit of analysis are given below;

- Only those universities and degree awarding institutions in KP which remained operational in the period 2013 and 2024.
- All the graduates (Business, IT and Computer, Engineering, Medical) completed their final degree from Public and private Sector Universities/Institutes of KP (Pakistan) in between the year 2013 to 2024.

Sampling Technique:

Data collection was based upon a multi-stage sampling technique. In the first phase the universities and institutes were purposely chosen both in the public and private institutions throughout the Khyber Pakhtunkhwa, Pakistan. This made it easy to classify the institutions that were present during this period. In the second phase, students who had graduated in the sampled universities and institutes were conveniently sampled in different districts. The research includes a special questionnaire that was used to collect data. Out of 1,200 questionnaires, which were sent to the graduates, 991 were received back and used in the analysis.

RESULTS AND INTERPRETATION

The chapter explains the statistical analysis of data. As explain above that survival technique analysis technique of Kaplan Meier and Mantel Cox was used to accomplish the objective of the study while descriptive statistics is used to explain the composition of the sample with reference to gender, education level and specialization.

4.1 Demographic of respondents

Following section explains the composition of respondents of study. Pie and bar charts are used to brief about gender, specialization, level of degree and age group.

Figure 1 Respondents on the basis of Specialization

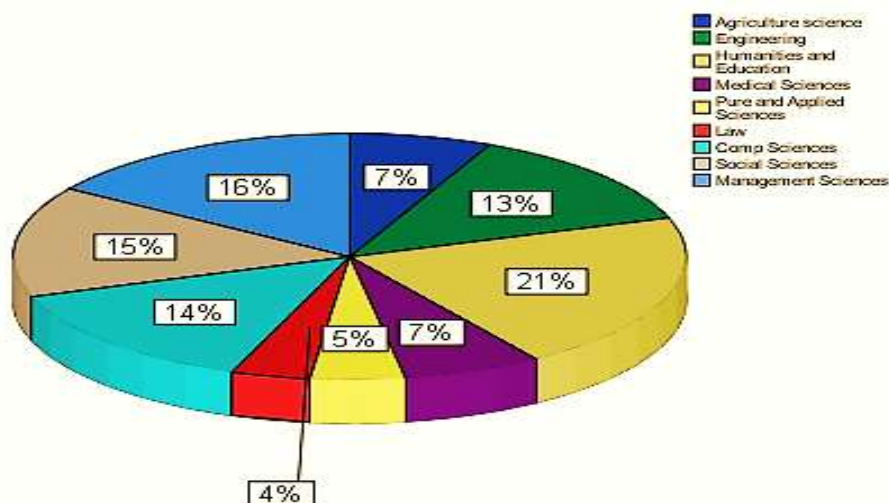


Figure 1 explained that respondents consist of 7% Agriculture Science, 13% engineering, 21% humanities and education, 7% medical, 5% pure and applied sciences, 4% law, 14% computer sciences, 15% social sciences and 16% management sciences. Opinions of Respondents from different fields were taped in to for accomplishment of the study objectives. The segregation of the respondents on the basis of level of education is explained with help of figure 2 below.

Figure 2 Respondents on basis of level of education

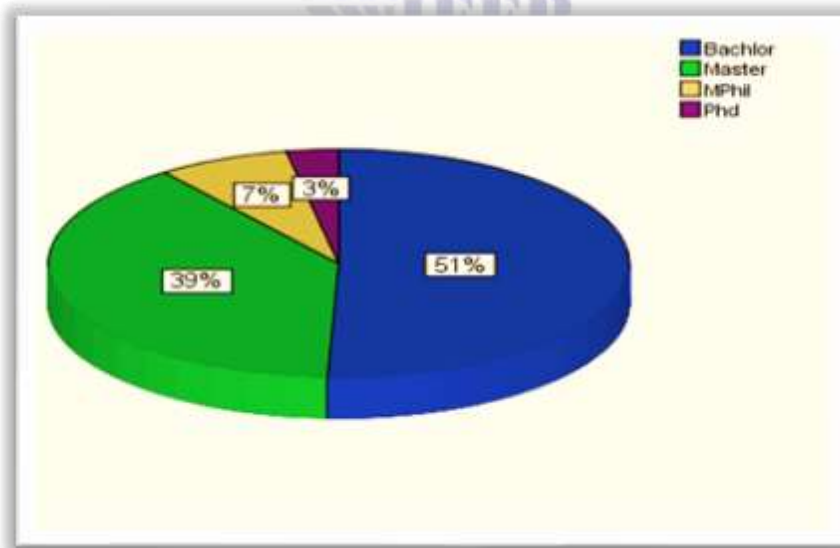


Figure 2 explains that 51% of the respondents were bachelor degree holders, 39% have master degrees, 7% have MPhil and 3% of respondents have PhD degree. Fig 4 briefed about the age composition of the respondents. 3% of the respondents were of the age group from (20-25), 50% of the respondents belong to age group of (25-30) major portion of respondents,

36% belongs to age group of (31-35) and 12% belongs to age group of 36 and above.

4.2 Waiting time to be employed

The study aims to estimate waiting time for a graduate in KP with respect specialization and level of education to be employed. Survival analysis technique

Kaplan Meir test is used to estimate waiting time for the graduate to be employed with respect level of education they are having. The result of the test be

described in Table 2 and figure 3 explains the result of test.

Table 1 Waiting time across the level of Education

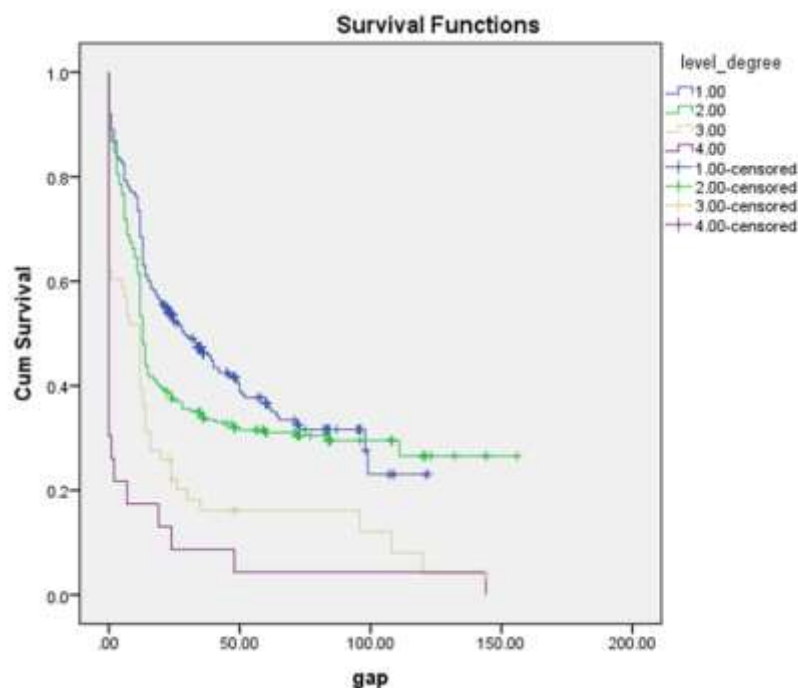
Level of Degree	Median for Survival Time Across Level of Education			
	Estimate	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
<i>Bachelor</i>	29.000	4.331	20.512	37.488
<i>Master</i>	13.000	.487	12.045	13.955
<i>MPhil</i>	12.000	2.235	7.619	16.381
<i>PhD</i>	.000	.	.	.
<i>Overall</i>	15.000	1.377	12.301	17.699

Source: Primary Data

Table 2 explains that with increasing level of education waiting time for employment decreases. A bachelor degree holder has to wait for longer time to be employed i.e. 29 months with lower bound of 20.5 and upper bound of 37.5 months. Respondents having master degree has to wait for about 13 months to be employed with lower bound 12 and upper

bound of 13.9 months. Data reveals that MPhil degree can help in reduction of one month waiting time to be in job market. MPhil degree holder wait for 12 month with lower bound of 7.6 and upper bound of 16.4 month to be employed which is one month lesser then the master degree. Data described that a PhD degree holder can be applied as he receive the degree. Figure 6 depicts the graphical representation of test.

Figure 3 Survival Time Across Education level



The data reveals that with investment in education at individual level enhances the chances for

employment. Furthermore this change in level waiting time is also not uniform like by getting the master

degree the time reduce from 29 months to 13 months with two years of investment while the similar time investment in degree of MPhil reduce is by one month and again with investment of at least 3 years will reduce the waiting time by 12 month. the lesser waiting time for PhD is also supported by principal of

demand and supply as with changing policies of HEC for universities enhance the demand for PhDs in country. Data also explain this difference with help of Log rank test which also indicate significant difference in waiting time of graduates with regard to level of degree.

Table 2 Log Rank Model for level of Degree

Log Rank (Mantel- Cox)	Level of degree	Bachelor		Master		MPhil		Phd	
		Chi-Square	Sig.	Chi-Square	Sig.	Chi-Square	Sig.	Chi-Square	Sig.
	Bachelor			7.861	.005	26.542	.000	47.226	.000
	Master	7.861	.005			10.416	.001	33.128	.000
	MPhil	26.542	.000	10.416	.001			4.306	.038
	PHD	47.226	.000	33.128	.000	4.306	.038		

Waiting time across specialization was also calculated with help of Kaplan meir test. Table 3 and figure 4 below explain the result of the result of the test.

Table 1 Waiting Time across Specialization

Specialization	Median Survival Time With Regard Specialization			
	Estimate	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
<i>Agriculture Science</i>	12.000	1.377	9.301	14.699
<i>Engineering</i>	25.000	4.105	16.955	33.045
<i>Humanities and Education</i>	15.000	1.660	11.747	18.253
<i>Medical Sciences</i>	12.000	1.208	9.632	14.368
<i>Pure and Applied Sciences</i>	12.000	1.797	8.477	15.523
<i>Law</i>	29.000	14.586	.412	57.588
<i>Computer Sciences</i>	22.000	9.951	2.497	41.503
<i>Social Sciences</i>	14.000	7.827	.000	29.342
<i>Management Sciences</i>	36.000	9.935	16.528	55.472
<i>Overall</i>	15.000	1.377	12.301	17.699

Source: Primary Data

Table 3 explain that management sciences graduate top the list of waiting time to be employed that is 36 month with lower bound of 16.5 and upper bound 55.47 month. second on the list are graduates of law, they wait for 29 month with lower bound .412 and upper bound of 57.6 month. Engineering graduates third on the longer waiting time to be employed in market with 25 month of waiting time having lower bound of 16.95 and upper bound of 33.04 month. Computer sciences graduates occupy fourth position on list of waiting time for job. A computer science

graduates wait for 22 month with lower bound of 4.8 months and upper bound of 41.50 month.

Table 3 explains that being graduates of humanities and education waiting time is 15 month with lower bound of 11.75 month and upper bound of 11.25 month third on the table of degrees with less waiting time. Social science graduates wait for 14 month with lower bound of .000 and upper bound of 29.34 months 2nd best in lesser time taken to be employed. The least time taken by a graduate to be employed belongs to specialization of agriculture science, medical science and pure and applied sciences with

estimate of about 12 months but still there is a difference of lower and upper bound of specialization. Graduates of agriculture have lower bound of 9.3 month and upper bound of 14.7 month while medical

sciences graduates have lower bound 9.63 month and upper bound 14.34 months and pure and applied sciences have lower bound of 8.48 months and upper bound 15.52 months.

Figure 4 Survival Time Across specialization

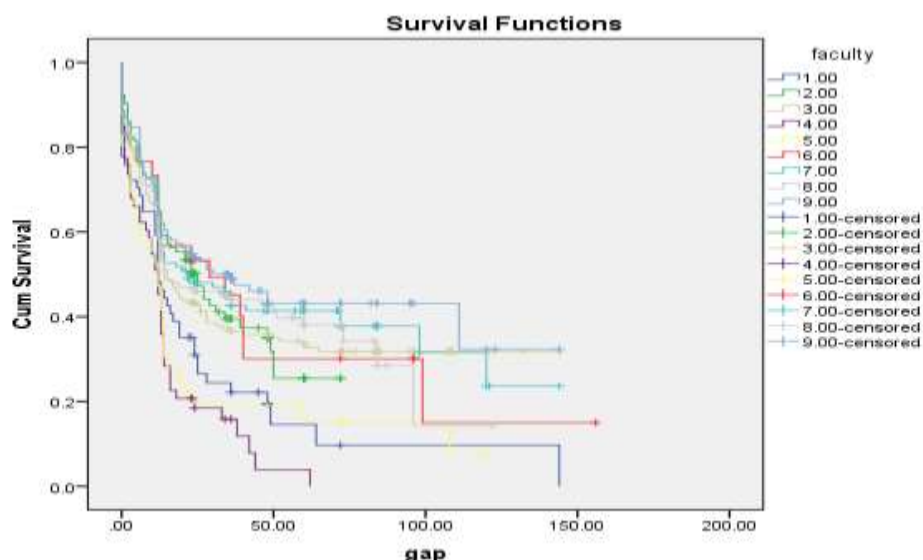


Figure 4 is graphical representation of waiting time across specialization of graduates. Data reveals that still there is greater opportunities agriculture, medical and pure and applied sciences graduates in KP market. Log rank test was applied to find out the significant difference across specialization to support the above statement. Study finding highlights that market saturation and complementary industry needs to be developed to observe the young graduates.

Discussion

The study aims to calculate waiting time for the graduate to be employed. The waiting time across degree level and specialization was calculated with the help of Kaplan mire model. The result of study indicates that the waiting time across level of education i.e. (Bachelor, Master MPhil and PhD) there is a significant variation in waiting time. Gradates and under graduates wait for longer time then master and MPhil and increase in education enhance the chances of employment. With bachelor degree they wait for 29 month, master degree holder wait for 13 months and MPhil wait for 12 months to be employed.

These findings are consistent with the study of Ollikainen (2003) who argued that higher education is instrumental in the reduction of unemployment especially among women. Likewise, Dagostino and Mealli 2000 found that in the UK, Belgium and Ireland, education above three years reduced

unemployment duration significantly; this was not found to be the case in Greece or Spain. These findings are also corroborated by Serneels (2001) who found that education has a positive role to play in minimizing the duration of spells in unemployment. Also, in a study done by Domadenik and Pastore (2004), it was revealed through a multinomial logit model that the tertiary education of young adults is a sort of insurance against unemployment. Kavkler et al. (2009) also confirmed the fact that the higher educational level leads to the decreased rates of unemployment in Central and Eastern Europe. Similar results also were reported by Ollikainen (2003), confirming the established correlation between education and reduced length of unemployment.

Van Ours and Ridder (1995) inspected growths in unemployment in the Netherlands during the 1980s downturn, when unemployment rates of less-educated workers increased more than those of more-educated

workers. They explained this phenomenon through job competition between workers of different levels of education or by employers dismissing replaceable less-educated workers before irreplaceable more educated workers. However, these findings are further strengthened by the study of Danacica and Baucea (2006), in which the researchers found out that the duration of unemployment reduces with improved levels of education.

Moreover, the findings also reveal that prolonged periods of unemployment are also the outcome of problems in the education system.

When waiting time across specialization was calculated there was a significant difference between waiting time across specialization. This can be justified with lower jobs availability and saturation of sector. Management sciences graduate wait for 36 month on average the longer waiting time on the list this can be explained due to saturation of the market as according to HEC there are 132 HEC recognized public and private universities and every university have a business school and graduating thousands of graduate into the market. The 2nd and 3rd on list is law and engineering with similar condition. As the applied sciences and agriculture science is least waiting time. As education sector is the largest employment provider which consumes most of pure and applied sciences and education graduates. With increasing fear of food shortage across the globe is the causation for employment in agriculture science.

Conclusion

On the basis of discussion the study can conclude that on average it took about 22 month for a computer graduate to be employed. The Medical, Agriculture, Pure sciences took 12 months which less for all graduate and 36 months for management science graduate to be employed. As the result indicates the waiting time across specialization vary according to market condition of demand and supply. As longer waiting time is in field of management sciences, engineering and law which can be explain by the saturation of market supply and lesser job opportunities in market. With increasing level of education the waiting time for employment decreases. The waiting time for employment decreases drastically by improving education from bachelor to master.

Guo Dong and Lu De (2005), suggest that learners must improve on their social communication skills and must offer to undertake internships during the studies as experience can help a lot to increase employability opportunities. Nonetheless, there is also a certain degree of uncertainty about the benefits of pursuing higher education as, at times, postgraduate education as such does not necessarily result in better employment than undergraduate degrees. Therefore, people should pay considerable attention to the possibility to move toward higher stages of education, which may suit their career objectives. Governments can play a significant role in ensuring that youth get more jobs by policymakers. Shen Jie (2005) has underscored on the need to put in place a formidable social support system to help the youth pursue problematic employment. These kinds of initiatives must equally be geared towards ensuring that students are well equipped to handle any job requirements in the increasingly global job market with a solid English language proficiency. Moreover, policies must be in place to provide students with conducive learning conditions that allow them practice skills to enable them be competitive in the global arena.

This research study is an outcome of a fully funded research supported by HEC-Pakistan under the NRPU project no:1848.

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