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Impact of Technological Change on Human Resource Development Practices in Pakistan: An Analytical Study

Imran A. Shahzad*, Komal Khalid Bhatti* and Gulfam Khan Khalid***

This study aimed at finding Impact of Technological Change on Human Resource Development practices and intensity of influence on different industries and finally comparing the frequency of Practices used by these industries against technological change. We used a single questionnaire comprising over three types of questions. Firstly it highlights the demographics of respondents along with experience, secondly it highlights the Human Resource Development Practices organization normally opt for employee development and lastly it asks about hindrances organizations face in the way of employee development. It all comprised over sample size consisted of 150 employees selected from five major industries in Islamabad / Rawalpindi, Pakistan. Organization size, business volume and geographical representation were taken into consideration.This study investigated the human resource development practices of organization in Islamabad where companies respond quickly and continuously towards technological changes in order to remain competitive. Findings show that mostly HRD practices are the same among different organizations; however some differences are found in educational institutions and Telecom Sector. On the job training was reported the most reliable tool for the Human Resource Development. At the end recommendations are given emphasizing on the continuous improvement in opting for the change management.

Field of Study: Human Resource Management

1. Introduction & Significance of Study

As technology gets change the business aspects get change along with customers' expectation from the organizations. Today at the turn of the millennium, Pakistani industries are at critical juncture. While the WTO agreement has shifted the paradigm of parameters of specific products for different market segments, skyrocketing competition among profit making players further compelled organizations to think seriously about their cost cutting at every level and customer acceptance along with stepping on the

*Imran A. Shahzad, PhD Scholar, Muhammad Ali Jinnah University, Islamabad, Pakistan, Email: Imran_rana77@hotmail.com
*Komal Khalid Bhatti, PhD Scholar, Lecturer / Research Associate, Muhammad Ali Jinnah University, Islamabad, Pakistan, Email: komal@jinnah.edu.pk
*Gulfam Khan Khalid, PhD Scholar, Muhammad Ali Jinnah University, Islamabad, Pakistan, Email: goolfam@hotmail.com

newly introduced technologies for the production of goods and service.
All production resources like; land, entrepreneurship and capital can be achieved with no much hard efforts but Labour (developed human resources) that actually can play winning part in game; is established over long periods of time and its retention with organization is really a challenge due to its scarcity in South East Asia and specifically in Pakistan. One of the best ways to penetrate in the market is to make unskilled labor force developed human resource.
In particular while many researchers were able to show an association between technological changes and human resource development practices in the west but very little effort is being made in this context in Asia in general and it Pakistan in particular.

2. Rationale of the Study

Very few studies are being conducted in order to find out the best HR Development practices along with different industrial sectors. Some other studies are also found indicating relationship among type of technological change and HR Development suitable practices all over the world but in Pakistan this concept is just getting roots. In fact, if we peep into the research world in Pakistan studies on impact of human resource development started taking their roots in 1970's and the impact of technological change on organizational productivity in 1980's But still after 30 years no solid research paper found representing true figures of impact of technological change on HRD practices.

No research has been conducted earlier that could identify the relationship and best suitable practices to guide HR processional It is often hard to explain; when, why and how this association and interconnections, exists, Identifying key practices, keeping an eye on current technological change as well as forecasting future. In this situation it gets more importance to guide the organization for selecting the best HRD practices to stay at the abreast of the competition.

3. Literature Review

HRD is concerned with training, development and education. HRD has been defined as an organized learning experience, conducted in a definite time period, to increase the possibility of improving job performance and growth. Training the acquisition of technology, which permits employees to perform their present jobs to standards. It improves human performance on the job the employee is presently doing or is being hired to do. Also it is given when new technology is introduced into the workplace. Training is defined as learning that is provided in order to improve performance on the present job. A person's performance is improved by showing her how to master a new or established technology. Development is training people to acquire new horizons, technologies, or viewpoints.[1]
Employee development is can play vital role in the success of any organization as; The concern for employee development reflects the underlying philosophy of the organizational leaders that the untapped contributions of human resources in the organization could make the difference between efficiency and inefficiency, death and

survival in the competitive environment. Organizational top management has realized that an effective and efficient organization does not evolve by chance, but is shaped by the way the leader respond to environment and utilize their resources.[2] Career development is providing opportunities/ conditions by an organization to the human resources so that they can occupy higher positions in an organization on the one hand and the human resources to put their all out efforts to utilize the opportunities / conditions provided by the organization and also on their own on the other.[3] An organization's conscious effort to provide its managers (and potential managers) with opportunities to learn, grow, and change, in hopes of producing over the long term a cadre of manager with the skills necessary to function effectively in that organization. Management Development can be provided through 1) Management Education 2) Management Training 3) On-the-job experiences [4]

Unlike other factors of production, manpower is not always available in the desired form, therefore, variegated training and manpower development schemes are devised to acclimatize them with the working of the organization. Employee development plans take care of future and present manpower requirements, performance appraisal, establishment of employee training and development programs and evaluation of such schemes.[5]

Employee development can play a vital role in the country's growth and wealth as; In recent years, the technologically advanced nations have shown burgeoning interest and importance in the optimum utilization and development of their human resources. Asian countries face significant and growing shortages of technically skilled workers. In Pakistan, and other developing countries, human resource development is still a fad, a luxury for a few organizations. Here human resource development activities are taken on without full commitment and understanding of their usefulness. [6] Employee development programs are further necessitated in case an organization is involved in technological changes, which often means an almost constant redistribution of talents from obsolescent skills to newer ones.[7] Multidimensional changes in technology, activities, specialization and social values have increased the importance of career planning and career development of human resources of organizations in present days.[8] Recognizing this, companies have begun to redefine the function of human resource development (HRD), and to rethink their expectations of it (Bates et al ., 2002; Clarke, 2004; Mulcahy & James, 2000; Thurow, 1996).[9] Developing human resources for the technical workforce: a comparative study of Korea and Thailand by Joshua D. Hawley and Jeeyon Paek[10] shows that Asian countries face significant and growing shortages of technically skilled workers (APEC, 2004).[11]

Technology simply refers to the processes by which an organization turns inputs into outputs, more specifically, however, technology represents the tools, machines and control devices use to carry out tasks and principals, techniques and reasoning which accompanying them. It also refers to the applications of knowledge and skills for the achievement of practical purposes. It can be said that technological change refers to the rapid change and development in technology that has a potential, like the knowledge explosion, to quickly lead out product / services obsolescence.[12]

Technological change is a constant phenomenon in contemporary organizations. How to prepare employees for technological change has increasingly become an issue for human resource development theory and practice.[13] It is anticipated that by the year

2006, as much as 60% of all training will be technologically based. This does not mean that new technology has been automatically embraced by individuals. The use of technology has enhanced communication and work groups and provided an even greater method of participating in this approach; it presumably allows more employee input into the decision-making process.[14]

4. Methodology

4.1 Research objectives

This study aimed to identify the best Human Resource Development Practices used by different organizations against fast technological change in broad sense; while more specifically following are objectives of the study;

1) What are the impacts of technological change on human resource development practices in Pakistani organizations?
2) What is the nature of the resistance to technological change experienced by Pakistani organizations?
3) What is the nature of differences among companies from various industrial sectors in using human resource development strategies to cope with technological change?

4.2 Hypothesis

H1: Technological changes influence Human Resource Practices.
H2: There are different HR Development practices in different industries against technological change.

4.3 Sample and Methodology

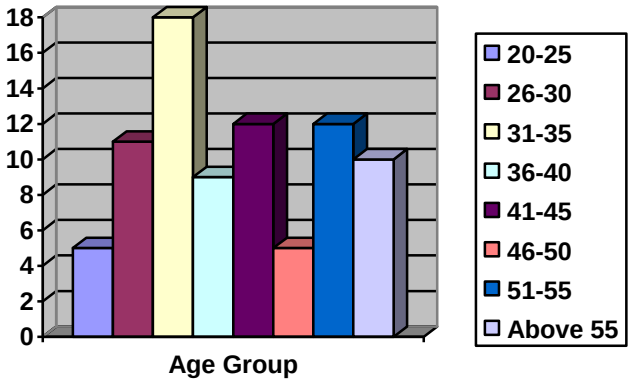
Sample consisted of 150 organization and only 82 organizations responded from different sectors of economy in Rawalpindi and Islamabad that are assumed to be undergone the abrupt technological changes. These are Financial Services institutes, IT and Telecom, Small and medium Enterprises, Educational Institutions, Administrative institutions and other. Overall response rate was 55%. It was used because technological changes are more likely to impact almost all type of organizations in one way or in other. Respondents were either HR managers or general managers.
The questions were carefully worded to avoid misinterpretation. Technical terms were also explained in simple language. The questionnaire layout was formatted in a logical and aesthetically pleasing manner to ensure a higher response rate. The structured questionnaire was designed using a five-point Likert-type response scale and some categorical items were provided for choosing frequency of use. The questionnaires were provided to the HR managers and Top Executives. Due to the initial low response rate, same process of survey was repeated three times.
Questionnaire (See Exhibit-1); comprising over two types of questions; first part consisted of questions in order to identify training and development schedules, level of the management normally trained, conducting and evaluation development strategies problems that organizations have to face hindrances towards technological change.

Methodology of the paper produced by AAhad M. Osman-Gani and Ronald l. Jacobs was followed as the same studies were conducted by above mentioned writers in Pakistan. Respondents were HR managers or Administrative Managers. The questionnaire second part calculated the best practices organizations opt for the Human Resources Development. All questions were already explained in simple and logical mangers. All questionnaires were filled by the personal presence of the researchers in order to ensure the complete understanding. Some of the questionnaires were filled thought telephonic conversation and emails.
Averages, Standard Deviations and Significance were calculated and analyzed in a very logical form in order to avoid any ambiguity. All the data was typed into software package SPSS, which was used to analyze the contribution of Independent Variables in the change in Dependent Variable.

5. Results / Discussion

A total of 82 responses could be used for the analysis after screening the returned questionnaires for their completeness and consistency. The relevant profiles of respondents are presented below through the following demographic information:

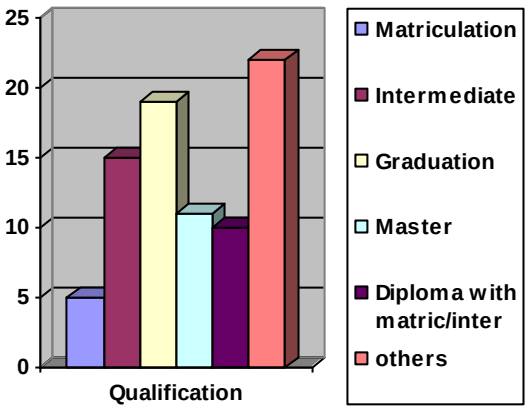
- 47 per cent of the respondents had an age more than 40 years.
- 48 per cent of the respondents have job experience more than 16 years.
- More than 80% of the respondents were male.
- In some cases (26.8%) training and development program are not properly planned and strictly followed.
- Training and development programs are highly encourage for Top Level Executives.
- External consultants and HR Professionals are important source for employee development and employee training.
- Amazingly, hiring developed workforce is used as best alternative for employee development i.e. app 75%.
- 22 per cent were from the SMEs (small & medium enterprises), and 78 per cent were from other companies.



Age Group		
Age	Response Rate	Response Rate In %
20-25	5	6
26-30	11	13.5
31-35	18	22
36-40	9	11
41-45	12	14.5
46-50	5	6
51-55	12	14.5
Abov55	10	12

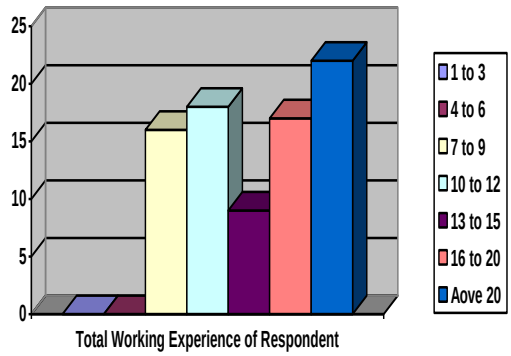
The age of respondents ranges from 20 years to 55 years and above. The maximum respondents

lie between the age ranges from 41-45 and 51-55. Whereas minimum respondents lie between the age ranges from 20-25 and 46-50.



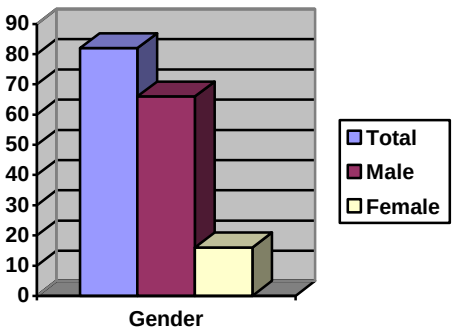
Qualification		
Qualification	Response Rate	Response Rate In %
Matriculation	5	6
Intermediate	15	18.3
Graduation	19	23
Master	11	13.41
Diploma with Matric/Inter	10	12.19
Others	22	26.8

The education/qualification of respondents ranges from matriculation to master and other degree holders.. The maximum respondents were others (having master degree and some advance studies. (26.8%) and minimum respondents were matriculates i.e. 6%.



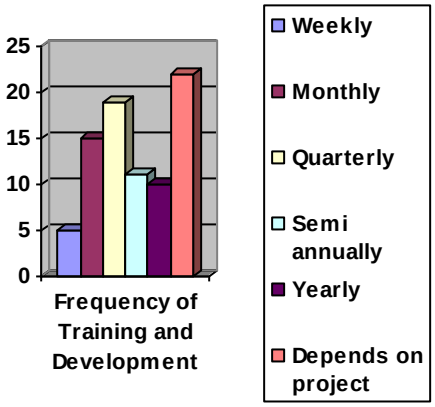
Total Working Experience		
Experience	Response Rate	Response Rate In %
1-3	0	0
4-6	0	0
7-9	16	19
10-12	18	22
13-15	9	11
16-20	17	21
ABOVE20	22	27

Th
e total working experience of respondents ranges from 1-3 to 20 years and above i.e. 27%. The maximum respondents had more than 20 years of experience and there were no respondent lie between 1-6 years i.e. 0%.



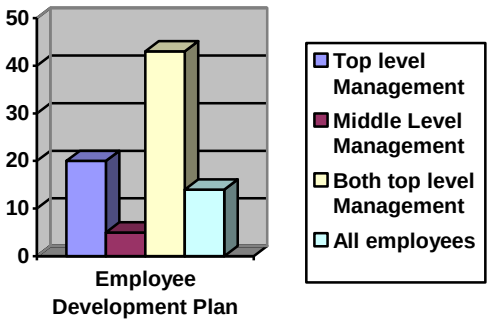
Gender		
Gender	Response Rate	Response Rate In %
Male	66	80.5
Female	16	19.5
Total	82	100

There were 66 male (80.5%) respondents and 16 female (19.5%) respondents.



Frequency Of Training And Developmemt Program		
Frequency	Response Rate	Response Rate In %
Once a week	5	6
Once a month	15	18.3
Once in 3 months	19	23
Once in 6 months	11	13.5
Once a year	10	12
Depends on project	22	26.8

The frequency of training and development programs in organizations was measured in terms of once a week to once a year. In most of the cases training and development program were organized quarterly. In the most of the cases, training and development program were not properly planned and strictly followed i.e.26.8%. They all depended on the nature of the project.



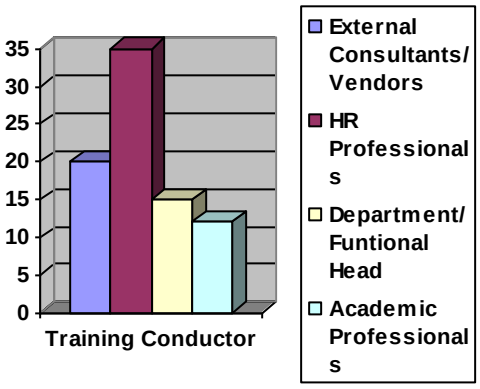
Development Program At Different Employee Level		
EMPLOYEE LEVEL	Response Rate	Response Rate In %
Top Level Management	20	24.5
Middle Level Management	5	6
Both Top Level & Middle Level Management	43	52.5
All Employee	14	17

In 52.5% organizations both top level and middle level employees were involved in development programs whereas there were in 17% organizations where all employees were involved in development program.

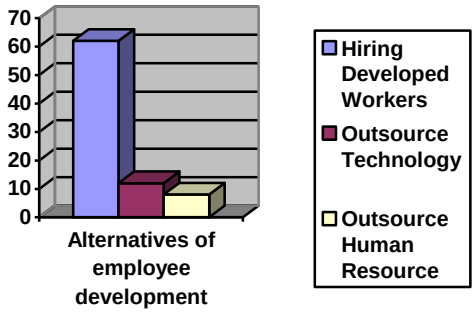
There were 42.5% HR professionals ,14.5% Academic professionals, 18.5% Departmental and functional heads and finally 24.5% External consultants that were involved in conducting training and development sessions.

In Pakistan, there is a small trend of organizational development practices in organizations. Therefore there are different methods that are used as alternatives. According to our survey, 75.5% organizations prefer to hire skilled and developed work force, 14.5% organizations outsource technology and 10% organizations prefer

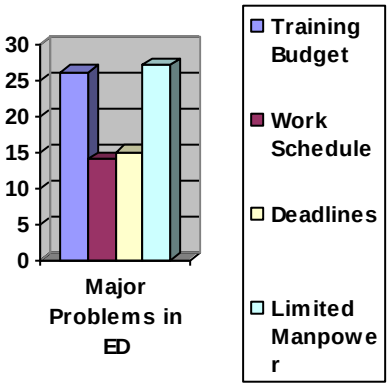
outsourcing human resource depend upon the policies they practice and technology they face.



Training Session Conductors		
Conductors	Response Rate	Response Rate In %
External consultants/Vendors	20	24.5
HR Professionals	35	42.5
Department/ Functional Head	15	18.5
Academic Professional	12	14.5

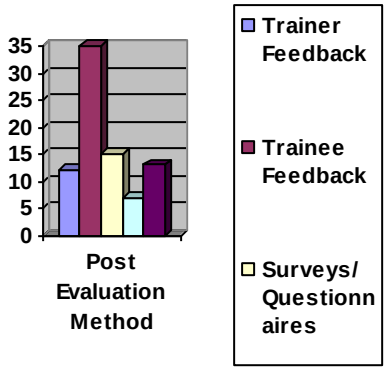


Alternatives Of Ed Used By The Organization		
Alternatives	Response Rate	Response Rate In %
Hiring developed work force	62	75.5
Outsource Technology	12	14.5
Outsource human Resource	8	10



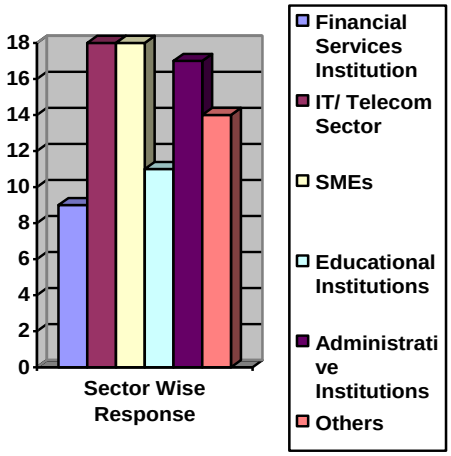
Major Problems In Developing Employees		
Problems	Response Rate	Response Rate In %
Training Budgets	26	31.5
Work schedule	14	17
Deadlines	15	18.5
Limited manpower	27	33

There are a lot of problems organizations are facing that are the source of hindrance for employee development. Among all of them training budget is the most serious one. Other problems include work schedules, deadlines and limited manpower.



Training Evaluation Method		
Method	Response Rate	Response Rate In %
Trainer Feedback	12	14.5
Trainee Feedback	35	42.5
Surveyors /Questionnaire	15	18.5
Supervisor feedback	13	16
Administration through Test	7	8.5

There is different post training evaluation methods for measuring the development of the employees in the organizations. Among them the most popular one is trainee feedback (42.5%). Administration through test method is least practiced one.



Industrial Sectors		
Industry	Response Rate	Response Rate In %
Financial Services Institution	9	11
IT/Telecom Sector	18	22
SMEs	18	22
Educational Institutions	11	13.5
Administrative Institutions	12	14.5
Others	14	17

Our research was based on five main industries and a small sample from miscellaneous industries. It includes Financial Services Institution with response rate 11%, IT/Telecom Sector with response rate 22%, SMEs with response rate 22%, Educational Institutions with response rate 13.5%, Administrative Institutions with response rate 14.5% and finally Miscellaneous with response rate 17%. Changes in information technology were the most frequently experienced technological changes in Pakistani organizations. Recruitment and selection were not found to play an important role in helping companies cope with technological changes. Pakistani companies were using other means such as training and development to cope with technological change. Employee training and skills development helped companies to cope with technological change. However, tight training budgets constrained the type and frequency of training programs. In general, employees were found to be motivated to

accept changes through the use of annual increment, bonuses, promotions and training opportunities. Motivational strategies enabled employees to face technological changes more positively. The role of planning change rested mainly with top management. The following sections present the results by responding to each research question of the study:

1. What are the impacts of technological change on human resource development practices of Pakistan companies?

The results showed that on-the-job training was the highest ranked training method used by different companies to cope with technological change (Table 1). The results also showed that most companies during this time used external consultants and vendors to provide human resource development expertise. The average length of time for the training was found to vary from one to three days. Surveys and questionnaires were the most frequently used training evaluation method.

2. What is the nature of the resistance to technological change experienced by Pakistan companies?

The results showed that psychological and emotional attitudes were the most frequent type of resistance encountered as a result of introducing new technology (Table 2). Different human resource development strategies are used to reduce the resistance to change. Communication and education, employee participation and involvement, and facilitation and support were the most frequently used human resource development strategies.

3. What is the nature of differences among companies from various industrial sectors in using the HRD strategies to cope with technological change?

Table 3 shows that significant differences were found among companies from the transport and communications sectors in terms of their use of overseas training ($p < 0.01$). No significant statistical differences were found across the business sectors in terms of the nature of training providers used by companies (Table 4). Table 5 shows that there were no significant differences in the training duration across companies from various business sectors. In terms of the use of training evaluation methods, significant statistical differences were found among business sectors in using trainer feedback (Table 6).

Table: 1 Training Methods used to cope with technological change

Frequency of use of training method	N	Mean	SD
On-the-job training	82	3.24	1.07
Seminars/workshops	82	2.99	1.09
Classroom/Lectures	82	3.09	1.11
Computer-based training	82	3.17	1.08
Small group discussions	82	3.01	1.11
Self-instructional materials	82	3.07	1.05
Overseas training	82	3.18	1.12
Audio and video tapes	82	2.96	1.1
Games and simulation	82	2.93	1
Written tutorials	82	3.06	1.11
Sensitivity training	82	3.13	1.04

*1 = Least frequently used…5= Most frequently used.

Table: 2 Strategies used for reducing the resistance to change

Strategies	N	Mean	S.D
Communication and education	82	3.09	1.06
Employee participation & involvement	82	2.94	1.05
Facilitation & support	82	3.15	1.01
Creating a common vision	82	2.99	0.97
Stress management	82	3.63	0.79
Team-building	82	3.21	1.04
Goal setting	82	3.27	1.01
Career planning	82	3.2	1.01
Negotiation and agreement	82	3.1	1.07
Job enrichment/analysis	82	3.38	0.92
Self-managed work teams	82	3.43	0.98
Restructuring/reengineering	82	3.04	1.1
Role negotiation/analysis	82	3.05	1.02

*1 = Least frequently used…5= Most frequently used.

Table3: Summary Results of the analysis of variance on the use of training methods by business sector

Frequency of use of training methods	Business Sectors																	
	Education			Financial Institutions			IT/ Telecom Sector			SME's			Administrative			Others		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
On-the-job training	11	3.55	1.04	9	3.22	1.09	18	3.56	0.98	18	2.94	0.96	17	3	1.12	9	3.33	1.32
Seminars/ workshops	11	3.18	0.98	9	2.89	1.05	18	3.11	1.13	18	2.94	1.16	17	3	1.12	9	2.67	1.22
Classroom /Lectures	11	2.82	1.17	9	3.67	1	18	2.78	1.11	18	2.94	1.16	17	3.47	1.01	9	3	1.12
Computer-based training	11	3.55	1.29	9	2.78	1.09	18	3.06	0.94	18	3.44	1.1	17	2.88	1.05	9	3.33	1.12
Small group discussions	11	3.36	1.21	9	2.89	1.05	18	2.78	1.11	18	2.94	1.01	17	3	1.17	9	3.33	1.32
Self-instructional materials	11	3.64	0.67	9	2.78	0.83	18	3.11	1.08	18	2.78	1.11	17	3.12	1.22	9	3.11	1.05
Overseas training	11	3.73	1.01	9	2.89	1.05	18	3.44	1.1	18	2.94	1.16	17	3.35	1.17	9	2.44	0.88
Audio and video tapes	11	3	1.18	9	2.78	1.09	18	2.94	1.11	18	2.94	1.11	17	2.82	1.13	9	3.44	1.13
Games and simulation	11	3	0.89	9	2.78	0.83	18	2.78	1.11	18	2.94	1	17	3.35	1.06	9	2.44	0.88
Written tutorials	11	3.36	1.43	9	3.67	1	18	3	1.03	18	2.94	1.16	17	2.71	0.92	9	3.11	1.17
Sensitivity training	11	3.36	1.29	9	3.56	0.88	18	3.61	0.85	18	2.83	0.92	17	3	1.12	9	2.33	0.87

*1 = Least frequently used…5= Most frequently used. Significant at 0.05

	Business Sectors																	
	Education			Financial Institutions			IT/Telecom Sector			SME's			Administrative			Others		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
External Consultants / Vendors	11	2.82	1.01	9	2.78	1.09	18	3.44	1.11	18	3.12	1.05	17	3.33	1.13	9	3.44	1.16
Human Resource professionals	11	3.55	1.18	9	2.89	0.83	18	2.94	1	18	3.35	1.17	17	3.33	0.88	9	2.94	1.11
Department or Functional Managers	11	3.36	0.89	9	2.78	1	18	2.78	1.16	18	2.82	1.22	17	3.11	1.17	9	2.78	1
Academic Professionals	11	3.64	1.43	9	2.89	0.88	18	2.94	0.92	18	3.35	1.17	17	2.44	0.87	9	2.94	1.16

*1 = Least frequently used…5= Most frequently used.

Frequency of use of Training Duration	Business Sectors: Education			Financial Institutions			IT/ Telecom Sector			SME's			Administrative			Others		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
Once in a week	11	2.82	1.01	9	2.78	1	18	3.06	1.12	18	2.94	1.01	17	3.33	1.32	9	3.33	1.22
Once in a Month	11	3.55	1.18	9	2.89	0.88	18	2.78	1.12	18	2.94	1.05	17	2.67	1.22	9	3.33	1.12
Once in Three Months	11	3.36	0.89	9	2.78	1	18	3.11	1.01	18	3.44	1.17	17	3	1.12	9	3.11	1.12
Once in Six Months	11	3.64	1.43	9	2.89	1.09	18	3.44	1.05	18	2.94	1.22	17	3.33	1.12	9	2.44	1.32
Once in a year	11	3.73	1	9	3.67	1.05	18	2.94	1.17	18	2.78	1.17	17	3.33	1.32	9	3.44	1.05
Depends on projects	11	3	0.88	9	3.56	0.83	18	2.78	1.22	18	2.94	1.13	17	3.11	1.05	9	2.44	0.88

*1 = Least frequently used…5= Most frequently used.

Frequency of Training Evaluation Methods	Business Sectors: Education			Financial Institutions			IT/ Telecom Sector			SME's			Administrative			Others		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
Survey or Questionnaires	11	3.09	1.06	9	3.27	1.01	18	3.67	1	18	2.94	1.16	17	3	1.12	9	3.44	1.17
Supervisors Feedback	11	2.94	1.05	9	3.2	1.01	18	2.78	1.09	18	2.94	1.16	17	3.33	1.12	9	2.94	1.22
Administration of Test	11	3.15	1.01	9	3.67	1.05	18	2.89	1.05	18	3.44	1.1	17	3.33	1.32	9	2.78	1.17
Trainer's Feedback	11	2.99	0.97	9	3.56	0.83	18	2.78	0.83	18	2.94	1.01	17	3.11	1.05	9	2.94	1.13

6. Discussions and Conclusions

Employee training was found to have helped companies to cope with technological changes in Pakistan. However, tight training budgets, work schedules, deadlines, and limited manpower have constrained the use of the required training programs. In such cases, companies can consider using contract workers on a temporary basis of about six months/one year to relieve current workload. This is because those workers need not be trained since they can take over simple tasks and are relatively more cost-effective. This will allow employees to focus on critical job aspects that are technology dependent and more specific and relevant training programs could be provided for them, leaving non-critical work to contract workers. With the increasing use of the Internet and web-based technology by Pakistan, the applicant pool will increase and thus companies should consider the use of e-recruitment. This can be achieved by setting up a company website or by using e-recruitment services. Similar tools could

also be used for training and development programs. Training can be used as an effective tool for motivating and retaining the employees.

For example, scheduling an employee to a one-year overseas training program can help to boost morale. Other financial incentives such as the use of stock options can be useful in companies that face many technological changes, which demand the full attention and energy of employees to innovate in order to survive. This increases the employee's commitment to the company and motivates him/her to work harder for mutual benefits. Non-monetary, innovative and valuable incentives could be used more frequently to enhance employee motivation. For example, a point-scheme based on work performance can be devised to replace overtime pay. Points accumulated can be redeemed for incentives such as free staff lunch and reduced working hours.
Providing opportunities for continuous skills development through appropriate training programs will be a major motivating factor for updating the expertise needed due to technological changes.

It is recommended that companies increase their training budgets to accommodate more training programs for employees. However, it should be cautioned that training should be viewed as an investment and not an expense. Training programs are critical for upgrading employee skills when technological change occurs. Thus, there is a vital need for more resources to be allocated to training. Training programs should be structured to include technical training as well as management training. Of equal importance is the need for good change management and communication skills to ensure successful changes. Companies should continue using structured forms of on the- job training. Computer-based training should also be considered to enable employees to familiarize themselves with computer-related and Internet applications. However, the use of specific training methods would depend on individual company's needs. Outsourcing of non-proprietary training could be a good strategy as the management can focus on more important strategic issues and redirect the training programs to people who have the expertise and knowledge about the change. This is especially so with the increase in information technology. Shorter training duration allows companies to adapt to new technological changes and this enables them to gain an edge over their competitors. Thus, duration of training sessions should be appropriate to allow employees sufficient time to absorb new knowledge. Companies should conduct some form of training evaluation. This is because it would be valuable to the HR personnel in shaping and improving the company's future training programs.

Future Dimensions / Suggestions

The issue of selecting best suitable HR development practice to cope with the technological changes is very much critical as per the above study which defines the success or failure of any organization. This study can further be enhanced by including the more organizations in the sample throughout the country to generalize the results, further in order to check the validity of the results it can be checked in different other industries. Secondly same study can be conducted in other sectors of the economy in which Banking, Oil & gas and engineering are the most important in the current

economic conditions of Pakistan. This type of study can also be enhanced to the Public Sector Undertaking where public and private sectors can be compared.
Future researchers could use a larger sample of companies to improve on representation. The study covered only technological change and its impact on HRD strategies; hence researchers may want to consider studying other types of changes, such as organizational changes. Reasons driving technological changes and the frequency of changes can be investigated to determine an appropriate period for companies to retrain workers to cope with new changes.

Other HRD issues such as career development, performance appraisal and industrial relations can be explored. Organization variables affected by technological changes such as organization structure, job design, authority, responsibility and communication patterns could also be included. To obtain a more comprehensive and in-depth study, employees could also be included as respondents to show the impact of various HR strategies on different interest groups. The length of business experience can also be incorporated to see if there are significant differences among companies of different years of experience in their use of human resource strategies to cope with technological change. Analysis between government-linked and private companies, as well as between listed and non-listed companies can be conducted. A comparison between technology firms such as Internet and software companies and non-technology firms could be examined for differences in HR strategies with regard to technological changes. Future research should focus on more detailed interviews and focus groups to obtain more comprehensive views of the current situation. Specific case studies could be conducted on representative companies to gain an in-depth knowledge of the impact of technological changes on HR within each company. The study may be replicated in other countries with an additional variable, national culture considered. It would be a valuable finding to prove that national culture varies from country to country hence enabling the development of an Asian model depicting the impact of technological changes on HR strategies.

7. Limitations of Study

1. Time was too short as it was supposed to be completed within four months in fall semester.
2. Limited Resources
3. There was no such study conducted earlier in Pakistan due to which primary data was also collected along with study, which resulted in; time as well as cost constrains.
4. Study was conducted by taking a small sample, which was the best representative of different industries; furthermore results cannot be generalized outside Islamabad/ Rawalpindi, Pakistan.

References

Gene Johnson, The Strategic Management of Human Resources in New Zealand, McGraw-Hill Company New Zealand Limited, p.86
Durrani Muhammed A, 1987 ”Employee development exploration of issues, problems and prospects,’ Pakistan Management Review”, vol. 28, pp.10-22

Choudhuri A H M Nurul Islam. JUN-1995 “Career planning and development of human resources in banks,’ Bank Parikrama-quarterly journal of Bangladesh institute of bank management”, vol.20, no. 1&2, pp.54-66.

DeSimone et al.2002, “Management Development”, 3 edition CH 13

Jafri s. M. Yunus. 1976, “Career planning some thoughts,’ Nipa Public Administration Review”, vol.1-3, pp.38-43.

Bates, R., Chen, H. C. and Hatcher, T. 2002, “Value priorities of HRD scholars and practitioners,’ International Journal of Training and Development”, vol. 6, no. 4, pp. 229–339.

Clarke, N. 2004, “HRD and the challenges of assessing learning in the workplace,’ International Journal of Training and Development”, vol. 8, no. 2, pp.140–156.

Mulcahy, D. and James, P. 2000, “Evaluating the contribution of competency-based training: an enterprise perspective,’ International Journal of Training and Development”, vol. 4, no. 3, pp.160–175.

Thurow, L. C. 1996, The future of capitalism: How today’s economic forces shape tomorrow’s world. New York: William Morrow and Company.

APEC 2004, Communiqué: Fourth APEC Science Ministers’ Meeting. Christchurch, New Zealand: Asia-Pacific Economic Cooperation.

Osman-Gani M AAhad. 2005 ” Technological change and human resource development practices in Asia: a study of Singapore-based companies,’ International Journal Of Training And Development” vol. 9, no. 4.

Appendix

Exhibit-1
SAMPLE QUESTIONAIRE

Respected Sir,

We are students of MS-HRM at Muhammad Ali Jinnah University, Islamabad. We are conducting a research on "Technological changes and Human Resources Development Practices in Pakistan", under the supervision of Dr. Syed Tahir Hijazi. In this connection, it is needed to measure the extent of relationship & frequency of different practices you use for employee development weather it is formal or informal, scheduled or unscheduled.
For this purpose, we have prepared a questionnaire; you being experts are required to evaluate each question according to the instructions given at the start of the Sections.

Best Regrards
Rana Imran,
Gulfam Khan Khalid
Komal Khalid Bhatti
PhD – (HRM)

Date---------- Department----------

Designation----------

Age (Please Tick your age Group)

a	20-25	b	26-30	c	31-35	d	36-40	E	41-45	f	46-50	g	50-55	h	Above56

Education (Please Tick your Education Group)

a	Matriculation	b	Intermediate	c	Graduation	d	Master	e	Diploma with matric / Inter	f	Other

Total years of Experience (Please Tick your Experience Group)

a	1-3	b	4-6	c	7-9	d	10-12	e	13-15	f	16-20	g	Above20

Section – 1
Training and Development Practices
Please select your industry:
☐ Financial Services Institution ☐ IT / Telecom Sector ☐ SMEs
☐ Educational Institutions ☐ Administrative Institutions ☐ Others
What is the frequency of training and development program in your organization?
☐ Once a week ☐ once a month ☐ Once in 3 months
☐ Once in 6 months ☐ once a year ☐ depends on Project
The employee development program is only for
☐ Top Level Management ☐ Middle Level Management
☐ Both Top Level and Middle Level Management ☐ All Employees
Who normally conducts training sessions
☐ External Consultants/ vendors ☐ HR Professionals
☐ Department / Functional Head ☐ Academic professionals
Training is normally evaluated through (can select more than one)
☐ Trainer Feedback ☐ Trainee Feedback ☐ Surveys/ Questionnaires
☐ Supervisor Feedback ☐ Administration through Test
In order to cope with the technological changes what are the alternatives of employee development used in the organization.

☐ Hiring Developed workforce ☐ Outsource Technology
☐ Outsource Human Resource
What are the major Problems in developing employees (can select max two)
☐ Training Budget ☐ Work Schedule ☐ Deadlines
Limited Manpower
☐ SECTION-II
In order to cope with the technological changes my organization uses following factors for employee development.
1- Strongly Disagree 2- Disagree 3- Indifferent 4- Agree 5- Strongly Agree

Factors:	R A T I N G				
Developmental Methodology					
On-the-job training	1	2	3	4	5
Seminars/workshops	1	2	3	4	5
Classroom/Lectures	1	2	3	4	5
Computer-based training	1	2	3	4	5
Small group discussions	1	2	3	4	5
Self-instructional materials	1	2	3	4	5
Overseas training	1	2	3	4	5
Audio and video tapes	1	2	3	4	5
Games and simulation	1	2	3	4	5
Written tutorials	1	2	3	4	5
Sensitivity training	1	2	3	4	5
Strategies					
Communication and education	1	2	3	4	5
Employee participation & involvement	1	2	3	4	5
Facilitation & support	1	2	3	4	5
Creating a common vision	1	2	3	4	5
Stress management	1	2	3	4	5
Team-building	1	2	3	4	5
Goal setting	1	2	3	4	5
Career planning	1	2	3	4	5
Negotiation and agreement	1	2	3	4	5
Job enrichment/analysis	1	2	3	4	5
Self-managed work teams	1	2	3	4	5
Restructuring/reengineering	1	2	3	4	5