

# The Necessity of Evaluation of Training that Calls for the Development of the Technical Knowledge and Skills Required for Freshers and Associates Working in Different Departments of Pharmaceutical Industry

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## ABSTRACT

This thesis is dedicated to my dear pharmacist and professionals working in pharmaceutical industry in different departments like R and D, Formulation, Analytical, QA, RA, Clinical research and others. A Pharma graduate (B.Pharm) or post graduate (M.Pharm) who is having a desire to make his/ her career in Pharma industry in different departments as mentioned above, who wishes to enhance their knowledge and Technical skills, but having no idea or little knowledge about the industry and current job requirements which comes as a part and parcel of the Development of Technical knowledge and skills by different Training methodology. The purpose of this research study was fivefold. First, to describe selected successful models of training and development of Technical knowledge and skills through various courses and Seminars/workshops as they may apply to colleges and Pharma industry in India. Second, to describe selected methods of needs assessment for training and development programs for fresher's and working employees and employers. Third, to identify selected managerial techniques those contribute to lost productivity and morale and build the confidence in employees. Also to identify learning and teaching methodology for college students. Fourth, to selectively assess what types of on job skills and knowledge are most essential for career success. Fifth, the results of this study suggest recommendations for developing a comprehensive plan (model) for the creation of effective employee training and development programs for Fresher's and working professionals in different departments like R and D, Production, RA, QA, Clinical, Patents and so on. This study was conducted by engaging in comprehensive review and critique of the existing literature on different training and development models used in industry.

**Keywords:** Training and Development in Pharma industry, RA, QA, Clinical, Analytical.

## INTRODUCTION

In Pharmaceuticals the fresher's and associates working in various departments like Analytical, Formulation, Quality Assurance, Regulatory Affairs (RA), Production, Clinical Research and others contribute towards the Product Development pathway till the market launch of various products in different countries of interest. Hence the most critical task for small scale Pharmaceutical/Biotech industry is to develop technical skills in these departments.

It has been seen that professionals often feel stuck up in a career after some period of time and eventually decide to leave an employer or the organization if their fundamental career requirements do not get fulfilled. Surprisingly, it has been also noticed by author that, there is always a demand gap for the talent supply for the pharmaceutical industry. The demand gap

is mainly because of the tremendous gap between the industrial demands for job oriented skills and personals ready with professional knowledge and the academic supply. Academic supply becomes useless either as a result of outdated educational curriculum or unawareness or lack of training for on-job skills and failure in updating with new science and technologies developing in the field of Pharma sectors.

The advancement in the technical skills is of the paramount importance in influencing the performance of the employee and hence the development of the training strategies. Indisputably, the need of the analysis or evaluation of training is quite inevitable with the aim of achieving the entailed fallouts. There can be many altered approaches towards the evaluation of the training such as the Training Needs Analysis, nonetheless, the

qualitative and quantitative research, being a motivator the employer's approach of assessment can be most fruitful in evaluation of the training and eventually on the way to the development of technical skills. The purpose, the process and objectives of the same have been delineated in this thesis of which the advantage can be taken in the submission and/or registration of dossiers in regulated or semi-regulated market.

## MATERIALS AND METHODS

**Chapter 1**, Introduction, covers various pre-emptive concepts. It is a preamble to the Pharma world elaborating the ways and means of how the knowledge is enhanced by taking proper training at different stages of career right from the fresher's till Pharma professionals. This chapter also talks about how the research was conducted previously by different people.

**Chapter 2**, Review of Literature, as the name suggests give a list of authors and the message they have given to the world. Enough literature is not available on the growth of Indian Pharmaceutical industry taking many parameters simultaneously. Whatever literature is available is in the form of papers/articles published in Pharma magazines and studies showing growth of Indian pharmaceutical industry by taking a few parameters only.

### Chapter 3, Objective

The main objectives of the research study are:

- To find out the gap between training methodology in MNC and Indian

organizations for development of Technical skills and Knowledge.

- To evaluate the need for training of fresher's and associates working in Pharma R & D especially in Analytical, Formulation, RA and QA departments.
- To evaluate current methodology of training and development program fresher's looking for job in small scale Pharma R & D especially in Analytical, Formulation, and RA/ QA departments.
- To develop new methodology of Effective training using good, basic training techniques.
- To evaluate the effectiveness of training before and after training Methodology applied in Indian Pharma, R & D and related departments like Analytical, Formulation, RA and QA.

**Chapter 4**, Research Methodology, gives the scientific and statistical base to the observations made. CSF/KPI (Critical Success Factor / Key Performance Indicator) method was used. Several types of seminars were conducted, hundreds of participants were served with a questionnaire and primary data was collected. Since the data collected was of the type "before training or course" and "after training or course", paired t-test was used for judging the significance or effectiveness of training. Another method used was ADDIE model (i.e. Analysis, Design, Development, Implementation and Evaluation).

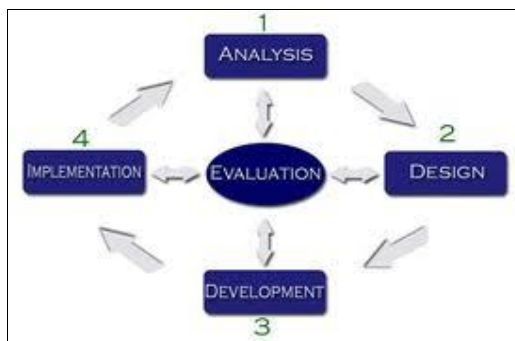


Fig. 1: The ADDIE Model

### Chapter 5, Hypothesis ( $\mu$ )

The author or researcher wants to show that there are some techniques, methodology for effective training and conduct short term on job relevant courses which enhance the career

of the Fresher's and working professionals. Associates working in R & D departments like Analytical, Formulation, and Quality Assurance or Regulatory Affairs perform the job better when they are trained properly with subject

knowledge. So the assumption/hypothesis made by the researcher that; existing education and training given to Fresher's and associates working in R & D and related departments does not help in improving technical knowledge and skills in respective area of job. This statement is the null hypothesis presented by the researcher.

**The effectiveness factor: [KPI = Key Performance Indicator]**

$$\text{The effectiveness Factor} = (\text{KPI})_{\text{after}} - (\text{KPI})_{\text{before}}$$

**The null hypothesis: [H<sub>0</sub>]**

The training course seminar is NOT effective. If KPI before the training course or seminar is more than the KPI after the training course or seminar, we can conclude that it is **NOT** possible to create and disseminate knowledge through research.

**The Alternate hypothesis: [H<sub>a</sub>]**

We wish to conclude that training course or seminars are effective if KPI before the training course or seminar is less than the KPI after the training course or seminar; we can conclude that it is possible to create and disseminate knowledge through research.

**Chapter 6**, Analysis of data; this chapter describes in details how the data was captured, entered into a database, analysed and the effective factor was calculated. Hypothesis testing was carried out. Sample size of 100 selected students and working professionals was considered suitable and practical. Some secondary data was also collected from other sources from the Internet.

**Chapter 7**, Finding and Suggestions; this chapter lists various findings such as Lack of awareness, Lack of proper Education and training, insufficient knowledge etc. This chapter discusses limitations of development of skills and knowledge. And also suggests remedies. Conventional remedies, future remedies, corporate remedies etc. Use of proper job relevant topics, Need Analysis, Training Methodology, Motivation, Questionnaires, Feedback, etc were suggested in this chapter.

**Chapter 8** gives the conclusions. It is neither possible to acquire 100% knowledge and skills and not possible to get 100% job satisfaction

but it is indeed possible to develop technical knowledge and skills as per the industrial requirements and current job needs to a large extent. Use of proper training, different job relevant courses, attending seminars, workshop, fast track programmes can give candidate a good level of confidence that they are dealing with the current job in this competitive world.

This exploratory study has been proposed in keeping with the apparent (or potential) gap in the extant literature that addresses the issues related Training and Development in the Pharma Industry in different departments like R & D, Analytical, Formulation, Quality Assurance, Documentation, Regulatory Affairs etc. This study could serve a significant fraction to that overall responsibility, or perhaps initiate similar thoughts for future guidance. It is intended that the current theme could be raised to a more rigorous inquiry in future studies.

**Chapter 9** gives the reference used in this thesis.

Appendix gives the details of how the Primary data was collected. Also gives a list of list of published articles and research papers of author, a list of national and Internationals seminars attended, participated; Survey of training methods used, Tools and Sample of Questionnaire used for a fresher's and working professionals etc.

**RESULTS**

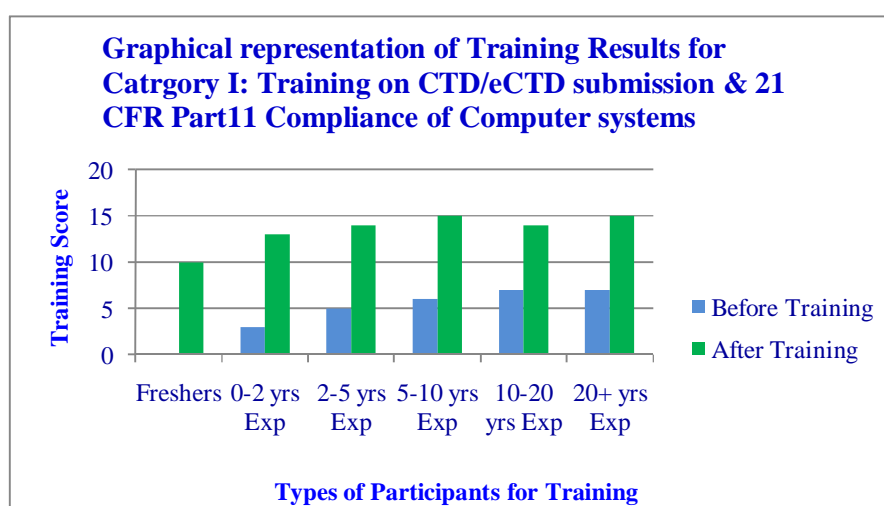
The data obtained from various training sessions, arranged for trainings and development of technical skills and knowledge, is broadly categorized into three different types as below:

- ✓ **Training Category I: Training on CTD/eCTD submission & 21 CFR Part 11 Compliance of Computer systems**
- ✓ **Training Category II: Training on Technical Documentation, Writing/Review Skills**
- ✓ **Training Category III: Training on Audits, Inspections & Validations**

The obtained results for different training programs conducted are tabulated below in Table 1, 2 and 3. The results show the significant increase in skill development and knowledge.

**Table 1: Results for Training Category I: Training on CTD/eCTD submission & 21 CFR Part 11 Compliance of Computer systems**

Sr. No.	Description of Participants	Before Training Score (Out of 15)	After Training Score (Out of 15)	Score Difference after Training	% Difference
1	Freshers	0	10	10	100
2	Professionals with 0-2 years' experience	3	13	10	333.33
3	Professionals with 2-5 years' experience	5	14	9	180
4	Professionals with 5-10 years' experience	6	15	9	150
5	Professionals with 10-20 years' experience	7	14	7	100
6	Professionals with 20+ years of experience	7	15	8	114.29

**Fig. 2: Column Chart of Category I: Training on CTD/eCTD submission & 21 CFR Part 11 Compliance of Computer systems****Table 2: Results for Training Category II: Training on Technical Documentation, Writing/Review Skills**

Sr. No.	Description of Participants	Before Training Score (Out of 15)	After Training Score (Out of 15)	Score Difference after Training	% Difference
1	Fresher's	3	15	12	400
2	Professionals with 0-2 years experience	5	16	9	180
3	Professionals with 2-5 years experience	6	18	12	200
4	Professionals with 5-10 years experience	8	17	9	112.5
5	Professionals with 10-20 years experience	8	18	10	125
6	Professionals with 20+ years of experience	9	18	9	100

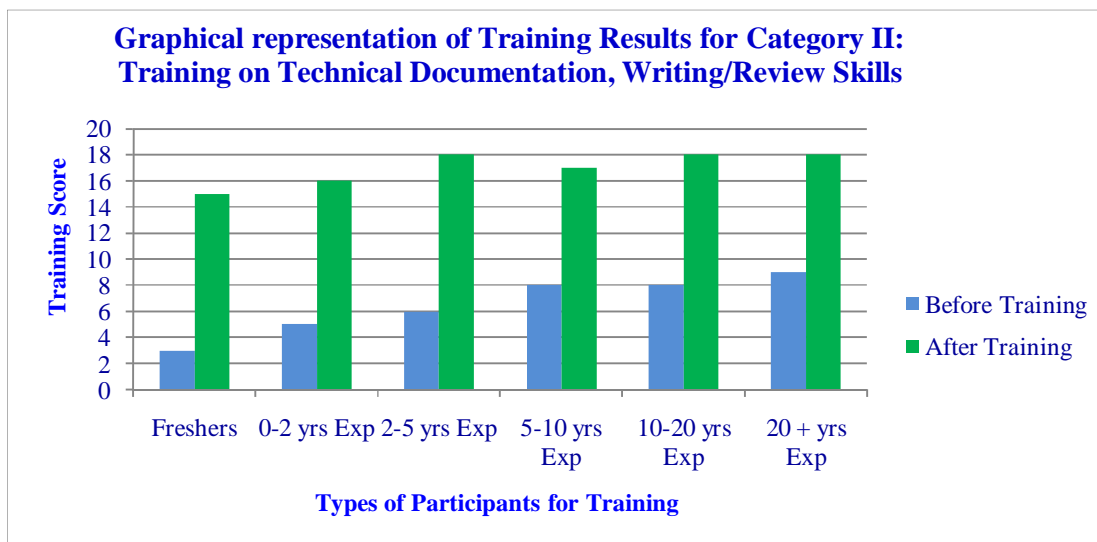


Fig. 3: Column Chart of Category II: Training on Technical Documentation, Writing/Review Skills

Table 3: Results for Training Category III: Training on Audits, Inspections & Validations

Sr. No.	Description of Participants	Before Training Score (Out of 15)	After Training Score (Out of 15)	Score Difference after Training	% Difference
1	Fresher's	3	12	9	300
2	Professionals with 0-2 years experience	4	13	9	300
3	Professionals with 2-5 years experience	6	14	8	266.67
4	Professionals with 5-10years experience	8	13	5	166.67
5	Professionals with 10-20 years experience	10	15	5	166.67
6	Professionals with 20+ years of experience	9	15	6	200

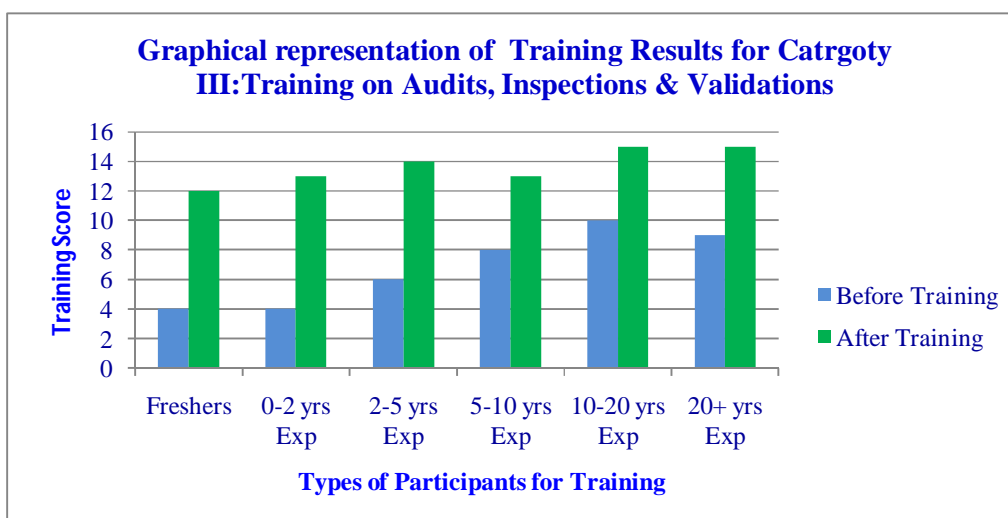


Fig. 4: Column Chart of Category III: Training on Audits, Inspections & Validations

## DISCUSSION

Effectiveness of trainings was detected via few of the following direct observations such as:

- **Development of skill confidence in freshers**

Freshers who have received the trainings build up with more confidence at their workplaces after training. The technical skills and knowledge acquired by them increased their confidence levels as the utilization of the same in their routine life at the workplaces. The number of mistakes found to be reduced with increase in performance.

- **Increase in skill confidence level of working professionals**

Due to trainings, the knowledge and job skills of working professional have been polished and there were adaptations of new skills and technologies. It has been observed for the working professionals having various years of experience, the acquired knowledge and skills have increased their confidence levels resulting in better performances than the previous ones. They have much more confidence and abilities to face the newer challenges to strive through the competent world.

- **Increased Career opportunities for Freshers**

The trainings and the knowledge gained by freshers helped them to grab more number of job opportunities than past. Freshers seemed to be for confident to face the interviews related to technical skills. This ultimately resulted in getting them jobs with handsome salaries; and making them eligible to enter in the skilled pharmaceutical fields.

- **Career growth of working professionals**

The ascending graph orders of career growth for the professionals have been found. Many of the training attendees grew up in their career with higher positions and opportunities in either existing organizations or in new organizations.

- **Career gap healing of professionals especially female candidates**

It has been found that many of the female professionals have the gap in-between their career due to several reasons like marriage, change in location because of marriage, pregnancy or maternity leaves, etc. The trainings provided to such participants tend to heal the gaps in-between their careers and they can gear

up with new start towards new horizons. The trainings served the purposes like to brush up with the job skills, get acquainted with latest science and technologies, new rules and regulations, awareness of the current industry norms, etc. It helped them to face the interviews confidently and get new career opportunities and jobs with good salaries.

- **On-job awareness in different areas like QA, QC, RA, R&D, etc.**

The trainings & knowledge helped the participants to become aware of different areas of the organization. The candidates who were previously unaware of the different departments and the respective functions came to know about departments like QA, QC, RA, R&D, Formulation development, Analytical, etc. This knowledge leads to build up the thought of team, team work, intra and inter departmental and overall links and bonding of all the departments' altogether for organizational success.

- **Development of on-job skills (Analytical, Formulation, etc.)**

Trainings helped to develop and improve on-job skills for professional and workers from different departments like Research and Development, Analytical, Formulations, and Documentations, etc. The awareness of on-job skills and knowledge has been increased in the participants.

## CONCLUSIONS

This exploratory study has been proposed in keeping with the apparent (or potential) gap in the extant literature that addresses the issues related Training and Development in the Pharma Industry in different departments like R & D, Analytical, Formulation, Quality Assurance, Documentation, Regulatory Affairs etc. This study could serve a significant fraction to that overall responsibility, or perhaps initiate similar thoughts for future guidance. It is intended that the current theme could be raised to a more rigorous inquiry in future studies.

## REFERENCES

1. Andrews, K. and Delahaye, B. (2000), "Influences on knowledge transfer processes in organizational learning: the psychological filter", *Journal of Management Studies*, Vol. 37 No. 6, pp. 797-810.



2. Bates, A.W. (2005), *Technology, E-learning and Distance Education*, Routledge, London
3. Becerra, M., Lunnan, R. and Huemer, L. (2008), "Trustworthiness, risk, and the transfer of tacit and explicit knowledge between alliance partners", *Journal of Management Studies*, Vol. 45 No. 4, pp. 691-713
4. Blanchard P Nick, James Thacker, [2004], *Training systems strategies and practices* "Prentice hall of India"
5. Changchit, C. (2003), "An investigation into the feasibility of using an internet-based intelligent system to facilitate knowledge transfer", *Journal of Computer Information Systems*, Vol. 43 No. 4, pp. 91-9.
6. Chen, C. J. (2004a), "The determinants of knowledge transfer through strategic alliances", *Academy of Management Proceedings*, pp. H1-H6.
7. Chen, C. J. (2004b), "The effects of knowledge attributes, alliance characteristics, and absorptive capacity on knowledge transfer performance", *R&D Management*, Vol. 34 No. 3, pp. 311-21.
8. Chen, S., Duan, Y., Edwards, J.S. and Lehane, B. (2006), "Toward understanding inter-organizational knowledge transfer needs in SMEs: insight from a UK investigation", *Journal of Knowledge Management*, Vol. 10 No. 3, pp. 6-23.
9. Cherry Yu, (2013), "Human Resource and its Role in Training and Development", *Training & Development Essay*, January 2013.
10. Christopher T Selvarajah, Tammy Sung-Wai Lau, Robert Taormina, (2000), "Management training & development: New Zealand study," *Journal of Management & Organization*, 2000, vol. 6, issue 1, article 435, pp 28.
11. Debra L. Truitt. (2011), "The Effect of Training and Development on Employee Attitude as it Relates to Training and Work Proficiency", *SAGE Open*, October - December 2011, vol. 1, no. 3, 2158244011433338
12. DeSimon, R. L., & Harris, D. M. (1998), 'Human resource development', Second Edition, The Dryden Press, Harcourt Brace College Publishers, 8.
13. Dessler, G. (1999), 'Human resource management', (8<sup>th</sup> edition). Upper Saddle River, NJ: Prentice-Hall, Inc.
14. Dyer, J.H. and Hatch, N.W. (2006), "Relation-specific capabilities and barriers to knowledge transfers: creating advantage through network relationships", *Strategic Management Journal*, Vol. 27 No. 8, pp. 701-19.
15. Eduardo Salas, Scott I. Tannenbaum, Kurt Kraiger, and Kimberly A. Smith-Jentsch (2012), "The Science of Training and Development in Organizations: What Matters in Practice", *Psychological Science in the Public Interest* 13(2), 74-101, 2012
16. G. Bharathi Kamath (2008), 'Intellectual Capital and Corporate performance in Indian Pharmaceutical Industry', *Journal of Intellectual Capital*, Vol.9 No.4
17. Galvin, Tammy, et al.(March 2003),"The 2003 Training Top 100 Training"(Obtained through ProQuest).
18. Guest, D. (1997), 'Human resource management and performance: A review and research agenda', *International Journal of Human Resource Management*, 8(3), 263-276.
19. Goldstein, I. L. (1986), 'Training in organizations: Needs assessment, development, and evaluation', (2nd edition.). Pacific Grove, CA: Brooks-Cole.
20. Harries, P.R., (Mar. 1979), 'Cultural awareness- Training for HR department'. pp. 64-74
21. Harvey, L. and Green, D. (1993), "Defining quality", *Assessment & Evaluation in Higher Education*, Vol. 18 No. 1, pp. 9-34.
22. Hay, D. and Strydom, K. (2000), "Quality assessment considerations in program policy formulation and implementation", *Quality in Higher Education*, Vol. 6 No. 3, pp. 209-18
23. Hefferman, T. and Poole, D. (2004), "'Catch me I'm falling': key facts in the deterioration of offshore education partnerships", *Journal of Higher Education Policy and Management*, Vol. 26 No. 1, pp. 75-90.

24. Herman Aguinis and Kurt Kraiger (2009), "Benefits of Training and Development for Individuals and Teams, Organizations, and Society" *Annual Rev. Psychol.* 2009. 60:451-474
25. Hoque, K. (1999), 'Human resource management and performance in the UK hotel industry' *British Journal of Industrial Relations*, 37(3), 419-443
26. Huselid, M. A. (1995), 'The impact of human resource management practices on turnover, productivity, and corporate financial performance', *Academy of Management Journal*, 38, 635-672.
27. Hyman, J. (2000), "Training and Development – the Employer's Responsibility", *Human Resource Manual* London, Blackwell Press
28. Industry Delhi business review, (Jan-Jun 2006), 7[1], 1-8
29. International review of business research papers, (Nov.2009), 5[6], 148-160
30. Jennifer L. Schneider, Anna Wilson and Joseph M. Rosenbeck (2010), 'Pharmaceutical companies and sustainability'
31. Joel Schettler (2002), "Should HR Control Training?" *Training* (1 July 2002), (Obtained through Factiva)
32. Kayrooz, C., Milne, T. and Ward, K. (2005), "Bridging the best of business and academic practice to bear on offshore evaluation in different cultural contexts", paper presented at the AIEC Australian International Education Conference, Gold Coast.
33. Ken Reid, UK (2010), *A Quality Assurance in Education*, Vol.18, No.1, pp 47-63
34. Lee, H.G. (2006), "Chapter 10: Globalisation and ethic integration in Malaysian education", in Saw, S.H. and Kesavapany, K. (Eds), *Malaysia: Recent Trends and Challenges*, ISEAS, Singapore, pp. 230-59.
35. Lee, W. W., & Owens, D. L. (2000), "Multimedia-based instructional design: Computer-based training, web based training, distance broadcast training". San Francisco, CA: Jossey Bass/Pfeiffer, A Wiley Company.
36. MacDuffie, J. P. (1995), Human resource bundles and manufacturing performance: Organizational logic and flexibility production systems in the world auto industry, *Industrial and Labor Relations Review*, 48, 197-221.
37. Mahoney, T., & Watson, M. (1993), Evolving modes of work force governance: An evaluation, in Kaufman, B. et al(eds), *Employee representation: Alternatives and future directions*, Ithaca, NY: ILR Press.
38. Majchrzak, A. (1988), *The human slide of factory automation*, San Francisco, CA: Jossey-Bass.
39. McNaught, C. (2003), "Innovation and change in higher education: Managing multiple polarities", *Perspectives*, Vol. 7 No. 3, pp. 76-82.
40. Patterson, M., West, M., Lawthom, R., & Nickell, S. (1997), 'Impact of people management practices on business performance', London: Institute of Personnel and Development.
41. Pharmaceutical executive, Available at: [pharmEx.com](http://pharmEx.com)
42. Pharmaceutical industry in India, Wikipedia, January 2012
43. Pharmaceutical industry, Available at: <http://wtocentre.iift.ac.in/papers/3.pdf>
44. Pucel, D. J. (1989), 'Performance-based instructional design Gregg Division', McGraw-Hill Publishers Co
45. Puthli, U., (Dec.1992), 'Career planning through multi skill development. 'The Telco experience *journal of management*.
46. R. Chandrashekar, (22 September 1999), "The Onus of Motivation Lies with the Boss," *Business*
47. Rakesh Sharma and Jyotsna Bhatnagar, (2009), vol.41, No.3-*Talent Industrial and Commercial Training*
48. Revital Gross (2008), *International journal of Health care-Quality Assurance*
49. Robbins, S.P., (1979), 'Organisational behaviour', Engle woods cliff, new Jersey. P-148
50. Rossett, A. (1998), *First thing fast: A handbook for performance analysis*. Library of Congress Catalog-in-Publication Data, Published by Jossey-Bass Pfeiffer
51. Rothwell, S. (1984), 'Company employment policies and new technology in manufacturing and service sectors', in Warner, M. (ed), *Microprocessors Manpower and Society*, Aldershot: Gower.
52. Rothwell, W. J. (1996), *ASTD Models for human performance improvement, roles, competencies, and outputs*, ASTD Publications Dept., 1640 King Street, Box 1443, Alexandria, Virginia 22313.



53. Rothwell, W. J., & Kazanas, H. C. (1992), *Mastering the instructional design process: A systematic approach*, 1st edition, (The Jossey-Bass management series).
54. Rothwell, W., & Benkowski, J. (2002), *Basic principles of instructional systems design* In R. Taft (Ed.), *Building Effective Technical Training: How to Develop Hard Skills within Organizations* (p.124) San Francisco, CA: Jossey-Bass/Pfeiffer.
55. Steedman, H., & Wagner, K. (1989), *Productivity, Machinery and skills: Clothing Manufacture in Britain and Germany*, National Institute Economics Review, May: 40-57.
56. Stolovtich, H. D., & Keeps, E. J. (1999), *Handbook of human performance technology: A comprehensive guide for analyzing and solving performance problems in organizations*. San Francisco, CA: Jossey-Bass Publications.
57. Storey, J. (1987), *New perspectives on human resource management*, London: Routledge and Kegan Paul.
58. Storey, J. (1995), (ed) *Human resource management: A critical text*. London: Routledge.
59. Susan M. Heathfield, (2008), "Training and Development for Employee Motivation and Retention" *The Lama Review*, 2008, Volume 20, Issue 2, pp. 20.
60. Thorndike, E.L., (1931), *The psychology of learning*. Teachers college, New York P-2
61. Tjinsite Survey (2012), 'On-the-job training boosts employee morale', Survey Article from *Economic Times*, May 24, 2012,
62. Tyson, S. (1997), *Human resources strategy: A process for managing the contribution of HRM to organization performance*, *The International Journal of Human Resource Management*, 8(3), 277-290.
63. Walton, M. (1990), *Deming management at work* New York, NY: G.P. Putnam's Sons
64. Wood, S. (1999a), *Getting the measure of the transformed high-performance organization*, *British Journal of Industrial Relation*, 37(3), 391-417
65. Wood, S., & Albanese, M. (1995), 'Can you speak of a high commitment management on the shop floor?' *Journal of Management Studies*, 32(2), 215-247.
66. Wood, S., & De Menzes, L. (1998), 'High commitment management in the U.K: Evidence from the workplace industrial relations survey, and employers, manpower & skills practices survey', *Human Relations*, 51(4), 485-515.
67. Juliana S. Manu (2004), "Training and development techniques for improving organizational performance for Ghanaian firms", A Research Paper Submitted University of Wisconsin-Stout
68. 'Skills and Knowledge Needs Assessment for Pharmaceutical Industry' (08 December, 2008) Authored By: AM Partners Consulting Company
69. Raja Abdul Ghafoor Khan, Furqan Ahmed Khan, Dr. Muhammad Aslam Khan (2011), "Impact of Training and Development on Organizational Performance" *Global Journal of Management and Business Research*, Volume 11, Issue 7, Version 1.0 July 2011.