

**COMPARATIVES STUDY OF TRAINING AND
DEVELOPMENT PROGRAM ON TEACHERS'
TECHNOLOGICAL COMPETENCIES: WITH SPECIAL
REFERENCE TO ENGINEERING EDUCATION**

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Abstract

Training and Development is one of the main functions of the human resource management department. Training refers to a systematic setup where employees are instructed and taught matters of technical knowledge related to their jobs. It focuses on teaching employees how to use particular machines or how to do specific tasks to increase efficiency. Whereas, Development refers to the overall holistic and educational growth and maturity of people in managerial positions. The process of development is in relation to insights, attitudes, adaptability, leadership and human relations (toppr, 2019). For current research work the data of 400 teachers from engineering department is taken and they are classified into two groups one who have completed their training and other who are not trained. The comparison between their views were conducted with independent sample t test to find out their technological competencies.

Introduction

Training of employees is always considered expensive, although now a day's management referred Training as an investment rather than an expense. In this highly competitive market for real talents, companies do everything they can to find and retain the best employees. There's no denying that employee training and development are crucial to the success of any organization. Through efficient training initiatives, companies can address various challenges that lead to massive profit loss, such as poor customer service, inflexible workforce, lack of product knowledge, materials waste, and low employee morale. Training Needs during In-service at Various Levels Continuous knowledge updating through suitably designed refresher courses will always be needed at all levels of the teaching career. These will mostly be subject-specific in the area of specialization. Also, it will be required to provide requisite training modules to train the in-service teachers for the responsibilities required to be carried out in their next professional cadres and also for the specialized inputs such as IPR issues, sustainable development, action research, curricular review, infrastructure development etc. Training of employees is always considered expensive, although now a day's management referred Training as an investment rather than an expense. No one can deny the importance of training and development for employees but training design can enhance knowledge base and skills of the employees. This paper therefore looks at training & development practice in the banking sector of Pakistan and its effect on employees' commitment to their organization, with the

supposition that organization which provide training to their employees perform better than those who did not do this. This argument is solid and based on the premise that the 'Training' perceived as a 'gift' from the employers by the employees (Barrett, 2001). The effect of such gift according to (Brum, 2010) will motivate employees and erg thoseto exert more effort, Brum further argue in the result of it, they become more committed to the organization. The idea parallels closely to the concept of reciprocity, that emphasizes that employee will help the organization, because the organization helped to employee (Brum, 2010).

REVIEWS OF LITERATURE

Kövesi and Csizmadia (2019)ⁱ examines the competency gap between the expected performance level by industrial companies and the perceived performance that recently graduated engineers deliver. Doğançay- Aktunaand Hardman (2018)ⁱⁱ revealed that to achieve professionalism, teachers and non- native teachers need to gain competence in disciplinary content knowledge about the nature of language, language learning, and language teaching, as well as pedagogical content knowledge regarding teaching strategies that they can use to make their teaching contextually appropriate and effective. Tondeur et.al, (2019)ⁱⁱⁱ investigated the profiles of teacher educators in order to explore their ability to prepare preserve teachers for technology integration in education. Specifically, toward ICT (in education), their ICT self- efficacy to design ICT- rich learning environments, their competencies to use ICT in their teaching practice and the strategies they use to prepare preservice teachers for technology integration. They revealed that teacher training institutions should consider their teacher educators to be gatekeepers when preparing future generations of teachers for the learning environments of the twenty - first century. In the discussion section, the implications for practice and future research are discussed. Jack, et.al., (2019)^{iv} address this gap between the technological competency and an Education Development Programme (EDP) for improving facilitation skills.

Echols (2018)^v revealed that competency- based (CBE) programs amongst 70 faculty members revealed significant relationship between total hours of training and level of competence was indicated with four types of training: one- on - one training with an expert, webinars, phone conferences, and self- study. Gregory (2019)^{vi} daimed that competent teachers of art develop over time – through their own childhood experiences and knowledge gained while at school, together with their professional training (as pre- service teachers) and their continuing professional development post-qualification.

Ho et.al., (2018)^{vii} aims to deliver a school- based mode of training for in- service teachers of students with ASD in Hong Kong. They revealed that trainees who were provided with the opportunity to apply learned skills in their own classrooms immediately and to share the knowledge and skills in dealing with students with ASD in the post - conference meetings.

Wang and Yao (2019)^{viii} revealed that with the increasing economic tie between the U.S. and China and the growing role San Antonio plays in the global economy, the demand for learning the Chinese language and understanding Chinese culture has also increased. Due to such a sudden increase in demand, many Chinese instructors in the city were hired without appropriate education and/or training in teaching Chinese as a second language. Therefore, there is a need to provide further training for those who have a teaching position but do not have appropriate education and/or training before. For better fulfilling the growing demand for the training, the CI at UTSA is going to set up an online training platform. Orr (2019)^{ix} revealed that Vocational education and training (VET) teachers and trainers are often overlooked in policy and research,

so in response this chapter reviews international literature to analyze their position and role. Leslie et al., (2018)^x explained that in the context of rapidly evolving development landscapes Massey University's own research with the New Zealand global development sector supports this view and we have adapted our core development management course accordingly. Fernández - Batanero, et al., (2019)^{xi} expressed that the integration of Information and Communication Technologies (ICT) into the inclusive classroom requires competent teaching staff from both the technological and pedagogical points of view. Within this context, and with the aim of looking at one of these theoretical premises, this study aimed to identify the degree of training and technological knowledge of primary school teachers in Spain with respect to the use of ICT with individuals with disabilities (functional diversity). A descriptive ex post- facto research method was used, where the sample comprised 777 teachers. An ad- hoc questionnaire was used as the data- collection instrument. The results revealed the low skill levels of the teachers with respect to the use of ICT with students with disabilities, where the level of training of the teaching staff was determined by personal (gender, age), professional (teaching experience) or educational (qualifications) variables. The findings of this study point to the need for teacher training that instructs teachers on the use of ICT in order to favor the learning and educational innovation of students with disabilities. Botha and Herselman (2018)^{xii} conducted a study to provide insight into how teachers became co-creators by merging their existing knowledge of their subject, context, and new knowledge of using mobile tablets towards enhancing their teaching practices.

Research methodology

Population: The universe of present study consists of all teachers from Engineering stream working in the geographical area of Rajasthan.

Sample unit

400 teachers are selected out of which 200 got training and rest were untrained.

Sample size: 400 engineering college teachers from South Rajasthan.

Sampling Technique: the respondents were selected using convenience sampling (using a cross-sectional design) from 500 teachers group. Care was taken to make the sample representative of the actual population.

Data Type: For achieving the objective of this study and to conduct the investigation, data was collected from both primary and secondary sources:

Primary data source: Primary data was collected from 400 teachers of engineering stream as per their training.

Secondary data source: Secondary data was collected through Books, Periodicals, Journals, Research papers, and case-study, Websites, Articles, and Newspapers. The use of internet was also of great help to the researcher as various search engines namely google.com, Online Directories like EBSCO and Google Scholar websites.

Data Collection Tool:

Survey questionnaire was used as data collection tool.

Data Collection period:

Surveys were distributed directly to shop owners over a six month period during August 2017 to January, 2018.

Data analysis

The variables selected are presented in table-1 as under

Table-1: Variables with SPSS code

Technological Competencies	Variable Name
Designing educational websites	EduWeb
File compressing and concurrent communication with search engines	SrchEngn
Producing multimedia	ProdMult
Using multimedia innovations	MultiInnv
Designing presentation	DesgnPrst
Use of Communication technology	ComTech

The descriptive of trained and untrained teachers selected are presented in table-2 & 3 as under:

Table-2: Trained Teachers

Descriptive Statistics ^a					
	N	Minimum	Maximum	Mean	Std. Deviation
EduWeb	200	1.00	5.00	4.1550	.78361
SrchEngn	200	1.00	5.00	4.0900	.71023
ProdMult	200	1.00	5.00	4.0100	.60142
MultiInnv	200	1.00	5.00	3.9800	.68699
DesgnPrst	200	1.00	5.00	4.1200	.83009
CommTech	200	1.00	5.00	4.0500	.72811
Valid N (listwise)	200				
a. Techr_Catg = Trained					

Table-3: Untrained Teachers

Descriptive Statistics ^a					
	N	Minimum	Maximum	Mean	Std. Deviation
EduWeb	200	1.00	5.00	2.8700	1.51146
SrchEngn	200	1.00	5.00	2.9850	1.47160
ProdMult	200	1.00	5.00	2.9500	1.54253
MultiInnv	200	1.00	5.00	3.1600	1.54152
DesgnPrst	200	1.00	5.00	2.8900	1.56850
CommTech	200	1.00	5.00	2.9550	1.57333
Valid N (listwise)	200				
a. Techr_Catg = UnTrained					

The table above showed a high mean value for the dimensions regarding contribution of training and development activities on enhancing Technological Competencies of trained teachers compared to untrained teachers. Further data is cross tabulated and independent sample 't' test is applied to test the statistical significance of difference mean scores of Technological Competencies between trained and untrained teachers.

Table-4: Independent sample 't' test for Technological Competencies

Group Statistics					
	Techr_Cat g	N	Mean	Std. Deviation	Std. Error Mean
EduWeb	Trained	200	4.1550	.78361	.05541
	UnTrained	200	2.8700	1.51146	.10688
SrchEngn	Trained	200	4.0900	.71023	.05022
	UnTrained	200	2.9850	1.47160	.10406
ProdMult	Trained	200	4.0100	.60142	.04253
	UnTrained	200	2.9500	1.54253	.10907
MultiInnv	Trained	200	3.9800	.68699	.04858
	UnTrained	200	3.1600	1.54152	.10900
DesgnPrst	Trained	200	4.1200	.83009	.05870
	UnTrained	200	2.8900	1.56850	.11091
CommTech	Trained	200	4.0500	.72811	.05149
	UnTrained	200	2.9550	1.57333	.11125

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
EduWeb	Equal variances assumed	215.94	.000	10.674	398	.000	1.285	.120
	Equal variances not assumed			10.674	298.769	.000	1.285	.120
SrchEngn	Equal variances assumed	206.85	.000	9.564	398	.000	1.105	.115
	Equal variances not assumed			9.564	286.933	.000	1.105	.115
ProdMult	Equal variances assumed	418.51	.000	9.054	398	.000	1.060	.117
	Equal variances not assumed			9.054	258.136	.000	1.060	.117
MultiInnv	Equal variances assumed	290.96	.000	6.871	398	.000	.820	.119
	Equal variances not assumed			6.871	275.048	.000	.820	.119
DesgnPrst	Equal variances assumed	209.65	.000	9.802	398	.000	1.23	.125
	Equal variances not assumed			9.802	302.363	.000	1.23	.125
CommTech	Equal variances assumed	299.94	.000	8.932	398	.000	1.095	.122
	Equal variances not assumed			8.932	280.502	.000	1.095	.122

CONCLUSION

Independent Sample 't' test with Levene's test for equality of variances has been used with assumptions that the variances for the two groups trained and untrained were equal. The gap between two defined categories is statistically significant for all the dimensions of Technological Competencies ($p < 0.05$) which connotes that significant difference in variances exist between trained and untrained group of teachers. Results of independent sample test revealed that trained teachers had more benefited from training and development activities. Trained teachers reported that have improved knowledge of Designing educational websites. They are effective in using file compressing and concurrent communication with search engines. Result showed that training improved their potential for Producing multimedia, using multimedia innovations, Designing presentation and use of Communication technology in teaching.

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