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Effectiveness of Diploma of Associate Engineers (DAE) Program Working under TEVTA in Punjab

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Abstract: Present study was aimed to investigate the effectiveness of the Diploma of Associate Engineers (DAE) Program working under TEVTA. The population of the study was comprised of all the employees (Civil, Mechanical and Electrical) working in public and private organizations in Punjab. Employees were selected on a convenient basis. Therefore, 143 employees were a sample of the study. A questionnaire for employees was adapted to collect the data. The reliability of the instrument was 0.847. Findings revealed that employees were satisfied with the DAE curriculum, physical facilities, and administrative facilities at their workplace. On the other hand, employees were not very satisfied with their assessment and evaluation systems and social factors affecting their workplaces. A significant mean difference was found in employees' perceptions regarding the effectiveness of DAE regarding their locale, job type, and trade. It is recommended that DAE graduates might be trained according to the industry demand rather than conventional knowledge.

Key Words: Curriculum, Physical Facilities, Administrative Facilities, Assessment and Evaluation System, Social Factors

Introduction

In general, the term "Technical Education" (TE) refers to postsecondary courses of study and practical training aimed at preparing technicians with technical skills over a two or three year period and technicians to work as early technicians in labour markets. Additionally, TE is a prerequisite for admission to higher technical education, engineering programs, and training. The term "Vocational Training" (VT) refers to a lower level of practical education and training that prepares a population of skilled or semi-skilled workers in a variety of trades/skills but does not raise their degree of education beyond the elementary level. Thus, "Technical and Vocational Education and Training" (TVET) is an applied component of education and training with a direct connection to early and rapid labour market entry. TVET equips workers with the necessary skills to take advantage of labour market possibilities such as employment contracts, wage premiums, union

membership, efficiency wages, health benefits, and improving cognitive and non-cognitive based quotients for increased earnings, among others (Herr, 2013).

A country's economic competitiveness is directly related to the capabilities of its workers. The workforce's skills and competencies, in turn, are contingent on the quality of the country's education and training systems (Mustapha, & Greeman, 2002). Additionally, (Aina, 2006) asserts that education is unquestionably the basis of any meaningful development, whereas Technical Vocational Education and Training (TVET) is the bedrock of any sustainable technical development program. Thus, TVET is seen as workforce education that, in its traditional function, aids in the adjustment of man's skills and knowledge to changing societal needs. This kind of teaching is purposefully intended to assist man in developing his abilities. It puts a premium on the

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development of people' skills in their chosen professions (Olaitan, 1993). Thus, TVET plays a critical role in improving the quality of work and the quality of TVET graduates, boosting job satisfaction and motivation, as well as increasing productivity (Manifred & Jennifer, 2004). Thus, TVET is anticipated to create an educated, competent, and motivated workforce in the changing economic climate.

Global socioeconomic developments are posing difficulties to the educational and industrial sectors. This tendency has resulted in economic, political, and social crises that have jeopardized certain countries' political and economic stability. According to (Giroux, 1991), increasing unemployment, a shortage of qualified employees, high dropout rates, and the changing demographic makeup of the workforce have elevated the problem of workforce education to the top of many countries' educational reform agendas. According to this perspective, (Okolocha, 2006) noted that the high rate of unemployment and changing face of the global economic, social, political, and labour markets have resulted in new education reforms/policies with a focus on TVET aimed at assisting adolescents and adults in becoming self-sufficient.

Objectives of the Study

Objectives of the study were to;

1. Find out the level of employees' perceptions about the effectiveness of the Diploma of Associate Engineers (DAE) program at the workplace.
2. Investigate significant mean differences of employees' perceptions about the effectiveness of the Diploma of Associate

Engineers (DAE) program at the workplace regarding their selected demographic variables (locale, job type, trade, qualification, age and experience).

Research Questions

Following were the research questions of the study.

1. What is the level of employees' perceptions about the effectiveness of the Diploma of Associate Engineers (DAE) program at the workplace?
2. Is there any significant mean difference in employees' perceptions about the effectiveness of the Diploma of Associate Engineers (DAE) program at the workplace regarding their selected demographic variables (locale, job type, trade, qualification, age and experience)?

Methodology

The present study was quantitative in nature. The population of the study was comprised of all the employees (Civil, Mechanical and Electrical) working in public and private organizations in Punjab. Employees were selected on a convenient basis. Therefore, 143 employees were a sample of the study. A survey questionnaire for employees was adapted to find out their views about the effectiveness of the Diploma of Associate Engineers (DAE) at their job place. The reliability of the instrument was 0.847. Data were collected personally by the researcher. Descriptive and inferential statistical techniques were used to analyze data. Results in the form of tables are given below.

Results

Table 1. Employees' Level of Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program Proposed by TEVTA

Measures	N	Minimum	Maximum	Mean	Std. Deviation
Curriculum	143	13.00	35.00	29.09	3.37
Physical Facilities at Job Place	143	23.00	50.00	40.79	7.27
Administrative Facilities at the Job place	143	35.00	65.00	51.50	6.25
Assessment and Evaluation	143	5.00	15.00	11.84	1.87
Social Factor	143	9.00	20.00	15.09	2.62

Table 1 indicates employees' level of perceptions about the effectiveness of the Diploma of Associate Engineers (DAE) proposed by TEVTA in

different aspects. Study findings revealed that the factor administrative facilities (M=51.50, SD=6.25) and physical facilities (M= 40.79, SD= 7.27) having

high mean scores, which mean employees are provided proper job facilities at their workplace. Whereas social factors have a low mean score ($M=15.09$, $SD=2.62$) which indicates that employees were a little bit anxious about social factors and kept continuing their practices.

Moreover, they were also seems contented with the DAE curriculum (29.09 , $SD=3.37$) taught to them, whereas they were not truly satisfied with the assessment and evaluation system at the workplace.

Table 2. Comparison of Rural and Urban Employees' Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program at Work Place

Variables	Locality	N	M	SD	df	t- value	Sig.
Curriculum	Rural	31	28.09	2.48	67.666	-2.276	0.026
	Urban	112	29.36	3.54			
Physical Facilities at Job Place	Rural	31	34.61	4.79	68.397	-7.297	0.000
	Urban	112	42.50	6.91			
Administrative Facilities	Rural	31	48.38	4.08	76.413	-4.159	0.000
	Urban	112	52.36	6.49			
Assessment and Evaluation	Rural	31	11.74	1.73	141	-0.349	0.728
	Urban	112	11.87	1.91			
Social Factors	Rural	31	16.12	2.18	57.312	2.533	0.006
	Urban	112	14.80	2.67			

An independent samples t-test was applied to find out the rural and urban employees' perceptions about the effectiveness of the DAE program based on five factors at the workplace. Findings revealed that a significant difference between rural and urban employees' perceptions about DAE curriculum, physical facilities, administrative

facilities, and social factors was found at $p \leq 0.05$ level of significance at the workplace. However, there was no significant difference between rural and urban employees' perceptions found regarding assessment and evaluation systems at $p \leq 0.05$ level of significance at the workplace.

Table 3. Comparison of Public and Private Sector Employees' Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program at Work Place

Variables	Job Type	N	M	SD	df	t- value	Sig.
Curriculum	Public	66	28.21	2.90	140.549	-3.007	0.003
	Private	77	29.84	3.58			
Physical Facilities at Job Place	Public	66	37.74	7.37	126.432	-4.947	0.000
	Private	77	43.40	6.10			
Administrative Facilities	Public	66	49.95	5.57	140.996	-2.840	0.005
	Private	77	52.83	6.54			
Assessment and Evaluation	Public	66	11.95	1.74	140.930	0.639	0.520
	Private	77	11.75	1.98			
Social Factors	Public	66	15.72	2.44	140.422	2.762	0.007
	Private	77	14.54	2.67			

In above table 3, the public and private sector employees' perceptions about the effectiveness of the DAE program based on five factors at the workplace were compared by applying independent samples t-test. Findings revealed that a significant difference between public and private sector employees' perceptions about DAE

curriculum, physical facilities, administrative facilities, and social factors was found at $p \leq 0.05$ level of significance at workplace. On the other hand, employees have no significant difference in assessment and evaluation systems in the organizations they were working at $p \leq 0.05$ level of significance.

Table 4. Program Wise Comparison of Employees’ Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program

Variables	Sum of Square	Mean Square	df	F	Sig.
Curriculum	46.132	23.066	2	2.052	0.132
	1573.686	11.241	140		
	1619.818		142		
Physical Facilities at Job Place	1727.706	863.853	2	20.917	0.000
	5782.000	41.300	140		
	7509.706		142		
Administrative Facilities	495.290	247.645	2	6.843	0.001
	5066.458	36.189	140		
	5561.748		142		
Assessment and Evaluation	1.108	0.554	2	0.156	0.856
	497.507	3.554	140		
	498.615		142		
Social Factors	76.069	38.035	2	5.892	0.003
	903.749	6.455	140		
	979.818		142		

In table 4 the employees’ (Civil, Electrical and Mechanical) perceptions about the effectiveness of the DAE program based on five factors at the workplace was compared by applying One-way ANOVA. Findings revealed that a significant difference between employees’ (Civil, Electrical and Mechanical) perceptions regarding physical facilities, administrative facilities, and social

factors was found at $p \leq 0.05$ level of significance at the workplace. On the other hand, employees (Civil, Electrical and Mechanical) have no significant difference about DAE curriculum and assessment and evaluation system in the organizations they were working at $p \leq 0.05$ level of significance.

Table 4(a). Program Wise Comparison of Employees’ Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program (Post hoc Tukey, HSD)

(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	Sig.
Civil	Electrical	-11.24109*	2.82543	.000
	Mechanical	-12.16878*	2.85023	.000
Electrical	Civil	11.24109*	2.82543	.000
	Mechanical	-.92769	2.67947	.936
Mechanical	Civil	12.16878*	2.85023	.000
	Electrical	.92769	2.67947	.936

In above table 4(a), post hoc (Tukey) results were indicated that a mean difference among employees’ perceptions belongs to Civil technology was significantly different as

compared to the employees’ of Electrical and Mechanical technology at $p \leq 0.05$ level of significance.

Table 5. Qualification wise Comparison of Employees’ Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program

Variables	Sum of Square	Mean Square	df	F	Sig.
Curriculum	34.215	8.554	4	0.744	0.563
	1585.603	11.490	138		
	1619.818		142		
Physical Facilities at Job Place	720.872	180.218	4	3.663	0.007

Variables	Sum of Square	Mean Square	df	F	Sig.
Administrative Facilities	6788.834	49.194	138	2.613	0.038
	7509.706		142		
	391.638	4			
	5170.110	97.910	138		
Assessment and Evaluation	5561.748	37.465	142	0.402	0.807
	5.738		4		
	492.878	1.434	138		
	498.615	3.572	142		
Social Factors	36.608	9.152	4	1.339	0.259
	943.210		138		
	979.818	6.835	142		

In table 5, the employees' perceptions about the effectiveness of the DAE program based on five factors at the workplace was compared by applying One-way ANOVA in terms of their qualification. Findings revealed that significant differences between employees' perceptions regarding physical facilities and administrative facilities were found at $p \leq 0.05$ level of significance

in terms of their qualification. On the other hand, employees have no significant difference of perceptions regarding DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working at $p \leq 0.05$ level of significance in terms of their qualification.

Table 6. Age-wise Comparison of Employees' Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program

Variables	Sum of Square	Mean Square	df	F	Sig.
Curriculum	21.989	4.398	5	0.377	0.864
	1597.830	11.663	137		
	1619.818		142		
Physical Facilities at Job Place	921.318	184.264	5	3.832	0.003
	6588.388	48.090	137		
	7509.706		142		
Administrative Facilities	289.681	57.936	5	1.506	0.192
	5272.067	38.482	137		
	5561.748		142		
Assessment and Evaluation	12.622	2.524	5	0.712	0.616
	485.993	3.547	137		
	498.615		142		
Social Factors	80.231	16.046	5	2.444	0.037
	899.587	6.566	137		
	979.818		142		

In table 6 the employees' perceptions about the effectiveness of the DAE program based on five factors at the workplace was compared by applying One-way ANOVA in terms of their age. Findings revealed that a significant difference between employees' perceptions regarding physical facilities and administrative facilities was

found at a $p \leq 0.05$ level of significance in terms of their age. On the other hand, employees have no significant difference about DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working at $p \leq 0.05$ level of significance in terms of their age.

Table 6(a). AgeWise Comparison of Employees' Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program (Post hoc Tukey, HSD)

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.
20-25 years	26-30 years	8.22632	4.98693	.567
	31-35 years	2.61667	5.28126	.996
	36-40 years	-2.95714	5.03126	.992
	41-45 years	5.75882	5.59193	.907
	46-50 years	6.17368	5.48184	.870
26-30 years	20-25 years	-8.22632	4.98693	.567
	31-35 years	-5.60965	3.65850	.643
	36-40 years	-11.18346*	3.28730	.011
	41-45 years	-2.46749	4.09420	.991
	46-50 years	-2.05263	3.94251	.995
31-35 years	20-25 years	-2.61667	5.28126	.996
	26-30 years	5.60965	3.65850	.643
	36-40 years	-5.57381	3.71869	.666
	41-45 years	3.14216	4.44801	.981
	46-50 years	3.55702	4.30880	.962
36-40 years	20-25 years	2.95714	5.03126	.992
	26-30 years	11.18346*	3.28730	.011
	31-35 years	5.57381	3.71869	.666
	41-45 years	8.71597	4.14808	.293
	46-50 years	9.13083	3.99844	.208
41-45 years	20-25 years	-5.75882	5.59193	.907
	26-30 years	2.46749	4.09420	.991
	31-35 years	-3.14216	4.44801	.981
	36-40 years	-8.71597	4.14808	.293
	46-50 years	.41486	4.68440	1.000
46-50 years	20-25 years	-6.17368	5.48184	.870
	26-30 years	2.05263	3.94251	.995
	31-35 years	-3.55702	4.30880	.962
	36-40 years	-9.13083	3.99844	.208
	41-45 years	-.41486	4.68440	1.000

In above table 6(a), post hoc (Tukey) results were indicated that mean differences among employees' perceptions having age group 26-30

years were significantly different with the employees having age group of 36-40 years at $p \leq 0.05$ level of significance in terms of their age.

Table 7. Experience Wise Comparison of Employees' Perceptions about Effectiveness of Diploma of Associate Engineers (DAE) Program

Variables	Sum of Square	Mean Square	df	F	Sig.
Curriculum	61.933	12.387	5	1.089	0.369
	1557.885	11.371	137		
	1619.818		142		
Physical Facilities at Job Place	535.234	107.047	5	2.103	0.069
	6974.472	50.909	137		
	7509.706		142		
Administrative Facilities	531.138	106.228	5	2.893	0.016
	5030.611	36.720	137		
	5561.748		142		
Assessment and Evaluation	25.537	5.107	5	1.479	0.201

Variables	Sum of Square	Mean Square	df	F	Sig.
Social Factors	473.078	3.453	137	2.472	0.035
	498.615		142		
	81.091	5			
	898.727	16.218	137		
	979.818	6.560	142		

In above table 7, the employees' perceptions about the effectiveness of the DAE program based on five factors at the workplace were compared by applying One-way ANOVA in terms of their experience. Findings revealed that a significant difference between employees' perceptions regarding administrative facilities and social factors was found at a $p \leq 0.05$ level of significance in terms of their experience. On the other hand, employees have no significant difference about DAE curriculum, physical facilities, assessment and evaluation system and effect of social factors in the organizations they were working at $p \leq 0.05$ level of significance in terms of their experience.

Discussion

The study was aimed to investigate the effectiveness of the Diploma of Associate Engineers (DAE) Program based on five factors (DAE curriculum, physical facilities, administrative facilities, assessment and evaluation system and social factors). Findings of the study revealed that employees at the workplace were satisfied with the curriculum taught to DAE graduates, where the curriculum is enough to make them knowledgeable and skill-oriented. Employees at the workplace also agreed that they were provided with facilities, for example, infrastructure, laboratories, transportation, fire-fighting, residence, and equipped workshops at the workplace. On the other hand, employees were satisfied regarding administrative facilities (resource utilization, technology support, and provision of skilled employers). Employees, on the other hand, were not much satisfied with their assessment and evaluation system included compensations, promotions, opportunities for foreign training, and a professional development system at the workplace. It is further concluded that employees were not very satisfied with the feedback and assessment system at the workplace. Developing countries, including Pakistan, are relying on the development of skilled workers to contribute to their economy (Tilak, 2003). Pakistan needs to

prepare a class of workers who are high-level skilled and proficient in modern technology (Amjad, Haque, & Colclough, 2005). Findings further indicated that employees belong to rural and urban areas have significant differences in perceptions regarding the effectiveness of Diploma of Associate Engineers (DAE), including curriculum, physical facilities, administrative facilities, and social factors as compared to assessment and evaluation systems in organizations. Moreover, employees working in public and private sectors have differences of perceptions regarding DAE curriculum, physical facilities, administrative facilities and social factors as compared to the assessment system at the job place. It was further indicated that civil, mechanical and electrical engineers have differences of perceptions regarding physical facilities, administrative facilities, and social factors affecting them at the workplace. However, they were not satisfied with the assessment and evaluation system at the workplace. It was further revealed that age-wise differences of opinion were found among employees regarding physical facilities and social factors, but employees have no significant difference about DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working in terms of their age. Employees' perceptions regarding their experience were found to be significant about administrative facilities and social factors as compared to DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working. It was found in the literature that the employability of TVET graduates, employers in Nigeria believed that TVET graduates are not well prepared to enter the competitive workplace and do not possess technical skills in their areas of specialization (Bappah & Medugu, 2013).

Conclusion

It is concluded that employees were satisfied with the DAE curriculum, physical facilities, and administrative facilities at their workplace. On the

other hand, employees were not very satisfied with their assessment and evaluation systems and social factors affecting their workplaces. A significant mean difference was found in employees' perceptions regarding the effectiveness of (DAE) program regarding their locale, job type, and trade. Employees' perceptions regarding their experience were found to be significant about administrative facilities and social factors as compared to DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working. It was further revealed that age-wise differences of opinion were found among employees regarding physical facilities and social factors, but employees have no significant difference about DAE curriculum, assessment and evaluation system and effect of social factors in the organizations they were working in terms of their age.

Recommendations

Following are the recommendations of the study.

1. Curriculum planners and implementers should enhance skill development strategies.
2. It is recommended to hire teaching faculty who have knowledge and skills to train DAE graduates according to the industry demand.
3. Laboratories should be well equipped with apparatus to develop skills among DAE graduates.
4. It is recommended to provide On Job Training (OJT) to DAE graduates to improve the organization's standard.
5. It is recommended that government may create job opportunities and ensure job securities for DAE graduates in Punjab.
6. It is further recommended that employees' promotion criteria should be defined for DAE graduates at the workplace.

References

- Aina, O. (2006). Technical and Vocational Education (TVE) in Nigeria: The way forward. Paper presented at the ETF zonal sensitization workshops on the importance of technical and vocational education in Nigeria, Port Harcourt.
- Giroux, H. (1991). Series introduction: Reading work education as the practice theory. In R. I. Simon, D. Dippoo, & A. Schenk (Eds.), *Learning Work: A Critical Pedagogy of Work Education*. New York: Bergin & Ganvey.
- Herr, E. L. (2013). Trends in the History of Vocational Guidance. *The Career Development Quarterly*, 61(3), 277–282. <https://doi.org/10.1002/j.2161-0045.2013.00056.x>
- Manfred, T., & Jennifer, W. (2004). *Vocational education and training: Key to the future*. Greece: Colibri Ltd.
- Mustapha, R. B., & Greeman, J. B. (2002). The role of vocational education in economic development of Malaysia: Educationists and employers Perspectives. *Journal of Industrial Teacher Education*, 39(2), 58-73.
- Okolocha, C. C. (2006). Vocational technical education in Nigeria: Challenges and the way forward. *Unizik Orient Journal of Education*, 2(1), 180-189.
- Olaitan, S. O. (1993). Essential considerations for an effective vocational-technical education development in Nigeria. Paper presented at 8th Annual conference of Nigerian vocational association at university of Uyo, Akwa Ibom State.
- Sadiq, A. (2013). Employers' Perception of the Role of Technical Vocational Education and Training in Sustainable Development in Nigeria. *IOSR Journal of Research & Method in Education (IOSRJRME)*, 2(3), 01–05. <https://doi.org/10.9790/7388-0230105>