

Evaluation of Diploma of Associate Engineers (DAE) Program Working under TEVTA

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Abstract

The present study aimed to evaluate the Diploma of Associate Engineers (DAE) program working under TEVTA by using seven parameters (curriculum, physical facilities, academic facilities, administrative facilities, method of teaching, assessment and evaluation and social factors) in province Punjab. The research design chosen for this study was concurrent mixed-methods because qualitative and quantitative data were collected to provide complete analysis of the research problem. Population of the study comprised all teachers, students and experts working in the respective field. Sample of the study consisted of 360 prospective Associate Engineers along with 120 teachers and seven experts. For quantitative data survey questionnaire was adopted to collect data from teachers and students. Reliability of the questionnaire was 0.91. Qualitative part was explored through in-depth interview. Purposive sampling technique was employed to conduct interviews from seven technical experts from TEVTA. Data were analyzed by using descriptive statistics (percentages, means and SD). Thematic analysis approach was used to analyze interviews. Findings of the study revealed that curriculum, academic facilities, administrative facilities, assessment and monitoring system, were adequate in all College of Technologies (GCTs) of Punjab. However, they required updated methods of teaching and sufficient equipment in labs to cope with the industry in future. It is recommended that effective planning and monitoring system needs to be done to produce skilled manpower for the development of industry in Punjab, Pakistan.

Keywords: Technical Education, Curriculum, Physical Facilities, Academic Facilities, Administrative Facilities, Method of Teaching, Assessment and Evaluation, Social Factors

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Introduction

Technical and vocational education is prepared to develop people for the specified abilities, capacities, capability, occupations, business, farming entrepreneurs and it is usually associated physical and hands-on skills and this mostly do not involve educational competencies (Ozioma, 2011). Vocational training usually is subjected towards instructions and development that is emphasized on more practical skills and made person eligible to work and execute errands in a specific field. Technical education is also alike, but the main emphasis is on technology and enhancements made in the field of computers and digital information.

The main advantage of the system of TEVTA is that it helps in lessening the rate of unemployment as it supports the young generation to develop the skills necessary for the need of the today's business. The main objective of TEVTA is to help and made available the human power in diverse areas, to make available technical information and vocational abilities. Proficient and capable individuals have major part in the development of economic, industrial development, personal development and to entice foreign ventures. Non employment and underemployment are the two considerate matters that are faced by numerous countries that include Pakistan and these matters are the hindrances in the path of economic development. The enrolment and accomplishment rate in the institutions of TEVTA are becoming less everyday that are consequently declining in proficient human power (Al-sad, 2007).

Literature Review

Economic growth of any country is dependent upon the skills possessed by entrepreneurs for producing goods and services of better quality at competitive prices. Khan (2005) propounded that the developing countries including Pakistan needs to work on technical education. For excelling in social and economic sector, knowledge and understanding of general education, study of technologies, accompanied by practical skills and attitudes, are vital. Therefore, technical knowledge along with general education is important (Mouzakitis, 2010). According to UNESCO (2009) in developing countries including Pakistan where a large number of young learners are deprived from being a part of formal education system, where there is a dire need for integration of non-formal learning methodologies and literacy programs into national education system which TEVTA is trying to incorporate in the whole system.

Technical and Vocational Education (TVE) has an important role in socio-economic development of a country. Properly trained and well skilled persons directly affect welfare of a society. To raise the potential of students at maximum level, development in technical and vocational education is strongly required. Rapid

advancement of technology across the globe has uplifted the importance of technical education for prosperity in future. In Pakistan, it is ominous to prioritize vocational and technical education for the prosperity of country (Kazmi, 2007; Tanveer, 2015). National education policy 2009 accepts technical education as a major source of enabling people for employability. People having technical skills are in better position for getting job in Pakistan as well as abroad.

The education system, however, is facing multiple challenges in Pakistan (Memon, Joubish, & Khurram, 2007). Advancements in technical and vocational education vary among provinces. The federal government and four provinces have taken several steps to gain the benefits and outcomes of technical and vocational education. Industrial nature of Punjab economy has strongly influenced the technical and vocational education system of Punjab. The very objective of technical education is not only to impart technical knowledge to the students but to enable them to win lucrative positions in the job market and contribute in economic growth of the country (Khan, Amjad, & Din, 2005). The major issues which are needed to be addressed for the development of technical education system are improvement in quality of technical education, availability of proper facilities, infrastructure, training equipments, machinery and linkage of intuitions with industry.

TEVTA is expected to provide prospective opportunities in the labor market for all categories of individuals to get decent work and maintain basic level of economic security. Employment is related empirically with skill levels and other aspects of human capital formation in TEVTA related literature. The transition from school to work in terms of getting employment readily after finishing school with the help of ready to use skills for income generation is a distinct feature of vocational education and training that provides implications for elimination of poverty among household and individuals (Muller & Wolter, 2014; Wolter & Ryan, 2011). National TVET Policy (2018) lists eight objectives for skill development for all the provinces of Pakistan including Punjab. Among these eight objectives, skill development, particularly for the youth population, is also aimed at achieving increased productivity, sustained economic growth, better job opportunities, targeting a milestone of 20 million TVET skilled labor force, up-skilling and re-skilling, export of skilled labor, and achieving labor market demand for skilled workers.

In a nut shell, this specific research study would be quiet helpful for the administration to figure out how effective the current program is, along with identifying the needs, resources, teaching material, costs and benefits of the diploma. By means of providing a thorough picture of the program, this evaluation study would be helpful administrators make relevant changes, additions and deletions to the program. Furthermore, perceived skills competencies revealed by this study will be helpful for

teachers to make wise decisions to improve students' competencies. It is hoped that the results of the study will provide valuable insights into the effectiveness of the program and be used as a framework for curriculum improvements.

The significance and purpose of TEVTA for Punjab is coined from the Punjab-TEVTA as an organization of skill provisions to the unskilled population of the province for better job opportunities, reducing unemployment, preparing skilled youth for mega projects and economic corridors, manage existing TVET system, promoting TVET system, bringing information about TVET and its linkages with labor markets, and many more purposes and functions related to TVET system strengthening for the province of Punjab.

Evaluation is a continuous and comprehensive process which involves judgments that cover all aspects of effectiveness of educational programs. With the increase in educational institutions, there is a need to focus on evaluation regarding effectiveness of education being imparted because education is responsible for shaping the future of individuals and society. Present study focuses on evaluating the Diploma of Associate Engineers (DAE) program working under TEVTA. In Pakistan, there is lack of awareness about the benefits of technical education among students, parents and society. Therefore, they have less interest towards technical education. Students' enrollment rates are less in technical education. In this regard with the help of evaluating the proposed program students and parents will aware of the benefits of technical education. People consider it low status education in society because of poor institutional infrastructure and availability of resources. Moreover, evaluation is considered a complicated process to address the program's resources and their utilization. It is considered an additional burden on staff. Therefore, the current study intends to evaluate the Diploma of Associate Engineers (DAE) program working under TEVTA by using seven parameters (curriculum, physical facilities, academic facilities, administrative facilities, method of teaching, assessment and evaluation and social factors) in Punjab.

Objective of the Study

Present study was aimed to evaluate the Diploma of Associate Engineers (DAE) program working under TEVTA in Province Punjab.

Research Questions

Following were the research questions of the study.

1. What are the perceptions of teachers and students about DAE curriculum?
2. What are the perceptions of teachers and students about the physical, academic, and administrative facilities in TVETA institutions?

3. What are the perceptions of teachers and students about the effectiveness of teaching methods used to teach DAE students?
4. What are the perceptions of teachers and students about the quality of assessment and evaluation strategies used by TEVTA regarding DAE program?
5. What are the perceptions of teachers and students about the effect of social factors on the quality of DAE program?
6. What are the views of the TEVTA experts regarding DAE curriculum development process?

Methodology

Present study aimed to evaluate the Diploma of Associate Engineers (DAE) Program Working under TEVTA. A mixed-methods approach along with concurrent mix-methods research design was employed to evaluate Diploma of Associate Engineers (DAE) program working under TEVTA. It helps to understand carefully to what people say, think and focus on specific context. Quantitative and qualitative data were collected at the same time and then integrate the information in the analysis for overall result. For qualitative data, in-depth interviews were taken and quantitative data were gathered through survey questionnaire.

Population of the Study

Population of the current study comprised of present directors, general manager curriculum, assistant directors, teachers, and students working in the field. There are (Civil= 87, Electrical= 119, Mechanical= 130) teachers and (Civil= 950, Electrical= 1274, Mechanical= 1257) students enrolled in DAE in GCTs of Punjab affiliated with TEVTA (P-TEVTA, 2018).

Sampling

Multistage sampling technique was used to draw sample from the population. At the first stage 8 colleges were selected from province Punjab by using simple random sampling technique. As there were three strata existed in the population (Civil, Electrical, and Mechanical) therefore, at the second stage stratified random sampling technique was used to draw sample from each stratum. Forty five prospective associate engineers (15 students from each stratum), fifteen faculty members from each college (120) were selected randomly. At the third stage 360 prospective associate engineers, 120 faculty members were selected as a sample of the study. Instrument was adapted for present study developed by Shah (2004) in his study. Reliability of the instrument was 0.91.

In-depth interviews of seven experts (General Manager Curriculum, Director R&D, Assistant Director R&D, District Manager, General Manager Academic and audit section, and General Manager Academic) were conducted after seeking their consent.

Sampling Framework

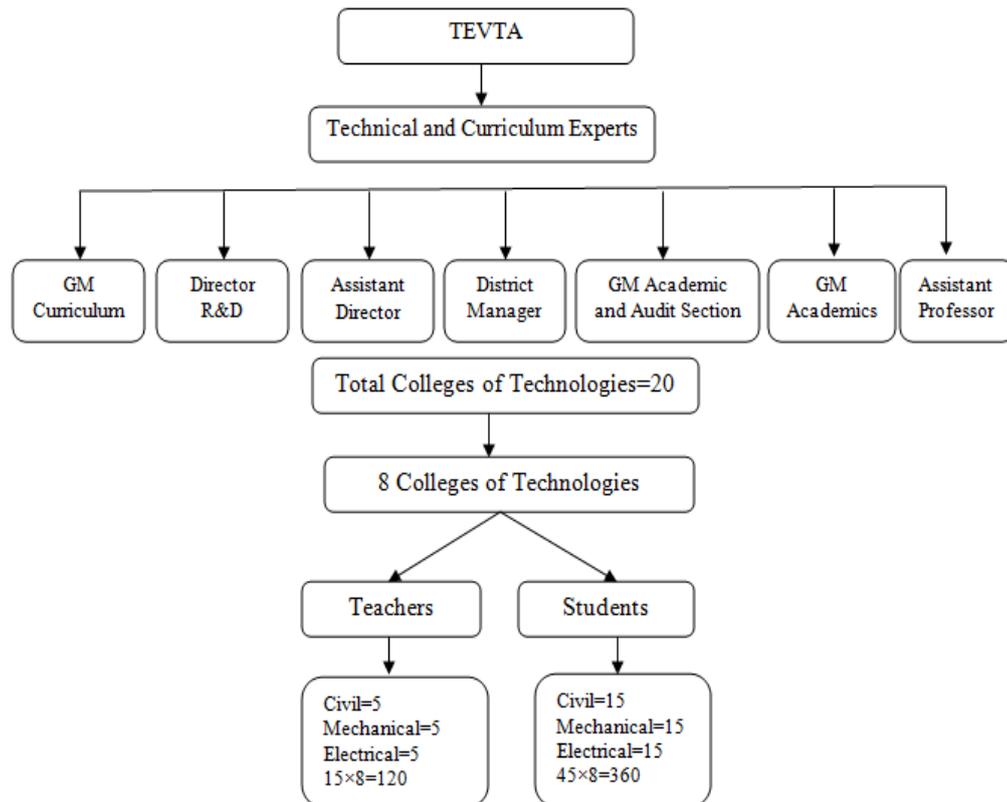


Figure 1. Sampling Framework

Data Analysis

Quantitative data were analyzed by using descriptive statistics, and qualitative data were analyzed by thematic analysis.

Results

Research Question 1: What are the perceptions of teachers and students about DAE curriculum?

DAE Curriculum

Table 1

Descriptive Scores of Teachers and Students' Perceptions about DAE Curriculum

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	The content of curricula achieves the course objectives.	Teachers	35.0	55.0	9.2	0.8	-	4.24	0.64
		Students	42.2	46.4	4.2	3.9	3.3	4.20	0.93
2	Urdu as a medium of instruction is useful.	Teachers	30.0	42.5	17.5	5.0	5.0	3.87	1.05
		Students	41.1	45.3	5.8	4.2	3.6	4.16	0.96
3	English as a medium of instruction is useful.	Teachers	33.3	25.8	19.2	11.7	10.0	3.60	1.32
		Students	26.7	47.5	9.7	9.2	6.9	3.77	1.14
4	Theory and practical work are separately completed.	Teachers	37.5	45.8	10.0	5.0	1.7	4.12	0.90
		Students	41.9	42.8	6.9	3.6	4.7	4.13	1.02
5	The curriculum is skill oriented for prospective associate engineers.	Teachers	32.5	50.8	15.0	1.7	-	4.14	0.72
		Students	43.6	47.2	6.1	1.1	1.9	4.29	0.79
6	Students participate in co-curricular activities.	Teachers	33.3	46.7	11.7	7.5	0.8	4.04	0.91
		Students	37.8	50.8	5.0	4.4	1.9	4.18	0.86
7	Industrial tours are arranged periodically.	Teachers	33.3	48.3	14.2	4.2	-	4.10	0.79
		Students	34.7	34.4	9.7	10.8	10.3	3.72	1.31

Teachers and students' perceptions about DAE curriculum was examined in above table. Findings of the study indicated that most of the teachers (90%) and students (88.6%) were agreed that "the content of curricula achieves the course objectives". Findings further revealed that (72.5%) teachers and (86.4%) students were agreed that "Urdu as a medium of instruction is useful" and (59.1%) teachers and (74.2%) students were agreed that "English as a medium of instruction is useful", moreover (83.3%) teachers and (84.7%) students were of the view that "theory and practical work are separately completed" and (83.3%) teachers and (90.8%) students perceived that "the curriculum is skill oriented for prospective associate engineers." Findings showed that (80%) teachers and (88.6%) students were agreed on that "students participate in co-curricular activities" and (81.6%) teachers and (69.1%) students were agreed that "industrial tours are arranged periodically." It is concluded from the above findings that teachers and students are satisfied with the DAE curriculum taught to them in TEVTA institutions.

Research Question 2: What are the perceptions of teachers and students about the physical, academic and administrative facilities in TVETA institutions?

Physical Facilities in TEVTA Institutions

Table 2

Descriptive Scores of Teachers and Students' Perceptions about Physical Facilities in TEVTA Institutions

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	Physical layout of laboratories is satisfactory.	Teachers	20.8	45.0	13.3	15.0	5.8	3.60	1.14
		Students	25.3	56.1	8.9	7.2	2.5	3.94	0.92
2	Labs are well equipped.	Teachers	28.3	40.0	15.0	11.7	5.0	3.75	1.13
		Students	25.6	42.6	9.4	11.9	10.8	3.59	1.28
3	Building of institution is well maintained.	Teachers	22.5	44.2	15.0	14.2	4.2	3.66	1.10
		Students	38.1	38.9	12.8	6.4	3.9	4.00	1.05
4	Sufficient computer facilities are available.	Teachers	37.5	35.8	16.7	9.2	0.8	4.00	0.99
		Students	50.0	33.6	7.2	3.3	5.8	4.18	1.09
5	Transport facilities are available.	Teachers	47.5	36.7	10.8	2.5	2.5	4.24	0.92
		Students	38.9	38.9	8.1	6.4	7.8	3.94	1.19
6	First aid facilities are available.	Teachers	29.2	35.8	16.7	11.7	6.7	3.69	1.20
		Students	25.8	53.9	7.2	9.4	3.6	3.88	1.01
7	Hostel facilities are available.	Teachers	35.0	28.3	11.7	12.5	12.5	3.60	1.39
		Students	17.5	54.2	11.9	12.2	4.2	3.68	1.03
8	Repair and maintenance is done properly.	Teachers	26.7	40.0	10.8	14.2	8.3	3.62	1.25
		Students	18.1	53.6	11.9	12.2	4.2	3.69	1.03
9	Fire-fighting facilities are adequate.	Teachers	12.5	41.7	17.5	23.3	5.0	3.33	1.11
		Students	20.6	37.2	15.3	14.4	12.5	3.38	1.30

Descriptive scores about teachers and students' perceptions regarding physical facilities provided in TEVTA institutions are showed in above table. It is obvious from the above findings that students were seemed to be satisfied with the physical facilities provided in TEVTA institutions. It seemed from the above findings that majority of the (65.8%) teachers and students (81.4%) were agreed that "physical layout of laboratories are satisfactory", moreover (68.3%) teachers and (68.2%) students perceived that labs are well equipped. Findings further revealed that (66.7%) teachers and (77.0%) students were agreed that "building of institution is well maintained", whereas (73.3%) teachers and (83.6%) students were agreed that "sufficient computer facilities are available." It is

indicated that (84.2%) teachers and (77.8%) students perceived that “transport facilities are available in institutions.” Further it is revealed that (65.0%) teachers and (79.7%) students were agreed that “first aid facilities are available”, moreover (63.3%) teachers and (71.7%) students were agreed with the statement that “hostel facilities are available”, (66.7%) teachers and (71.7%) students agreed on that “repair and maintenance is done properly” and (54.2%) teachers and (57.8%) students were of the views that “fire-fighting facilities are adequate” in TEVTA institutions. It is concluded that proper physical facilities (labs, building, computer, first aid, and hostel) are provided by TEVTA to DAE students, whereas fire-fighting facilities are not available properly.

Academic Facilities in TEVTA Institutions

Table 3

Descriptive Scores of Teachers and Students' Perceptions about Academic Facilities in TEVTA Institutions

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	Library facility is available in this institute.	Teachers	25.8	42.5	16.7	10.8	4.2	3.75	1.08
		Students	35.8	56.4	1.7	1.9	4.2	4.17	0.89
2	The latest books/journals are available in library.	Teachers	19.2	45.0	13.3	15.8	6.7	3.54	1.16
		Students	21.7	42.2	10.0	13.1	13.1	3.46	1.31
3	Technology support is available to the students when students need it.	Teachers	20.0	47.5	12.5	14.2	5.8	3.61	1.13
		Students	27.8	41.9	14.4	10.0	5.8	3.75	1.13
4	Recommended books are available relevant to the DAE program.	Teachers	29.2	51.7	10.8	3.3	5.0	3.96	0.99
		Students	30.8	48.1	11.7	5.6	3.9	3.96	0.99

Teachers and Students' perceptions about academic facilities in the institutions were investigated by descriptive statistics in above table. It was indicated that (68.3%) teachers and (92.2%) students were satisfied with the library facility available in institutes, (64.2%) teachers and (63.9%) students were agreed that “the latest books/journals are available in library”, (67.5%) teachers and (69.7%) students satisfied with the technology support available to the students when students need it (80.9%) teachers and (78.9%) students were agreed that “recommended books are available relevant to the DAE program.” It is concluded that majority of the teachers and students are satisfied with academic facilities (latest books/journals, technology support, recommended books, and learning material) provided to the DAE students in TEVTA institutions.

Administrative Facilities in TEVTA Institutions

Table 4

Descriptive Scores of Teachers and Students' Perceptions about Administrative Facilities in TEVTA Institutions

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	Institutions help their students to obtain employment in the market.	Teachers	35.0	46.7	10.8	5.0	2.5	4.06	0.94
		Students	28.3	39.2	11.1	10.3	11.1	3.63	1.29
2	The employment chances are sufficient for the DAE graduates.	Teachers	34.2	35.8	12.5	8.3	9.2	3.77	1.26
		Students	25.3	36.7	17.8	11.4	8.9	3.58	1.23
3	Guidance and counseling facilities are available in the colleges of technologies.	Teachers	15.8	47.5	15.0	15.8	5.8	3.51	1.11
		Students	34.2	50.0	7.8	4.2	3.9	4.06	0.96
4	Strict merit is followed in the admission policy.	Teachers	42.5	35.8	15.0	5.0	1.7	4.12	0.95
		Students	42.8	34.4	6.4	10.6	5.8	3.97	1.20
5	Effective monitoring and evaluation of institution is done periodically.	Teachers	38.3	47.5	12.5	1.7	-	4.22	0.72
		Students	28.1	48.3	14.4	6.7	2.5	3.92	0.95

Descriptive scores of teachers and students' perceptions about administrative facilities are given in above table. It is obvious from the findings that (81.7%) teachers and (67.5%) students were agreed that "institutions help their students to obtain employment in the market", (70%) teachers and (62%) students were agreed that "the employment chances are sufficient for the DAE graduates", (63.3%) teachers and (84.2%) students were satisfied with the guidance and counseling facilities available in the colleges of technologies, (78.3%) teachers and (77.2%) students were agreed that "strict merit is followed in the admission policy." Findings further revealed that (85.8%) teachers and (76.4%) students said that "effective monitoring and evaluation of institution is done periodically." It is concluded that students are satisfied with administrative facilities (employment opportunities, guidance and counseling facilities, strict merit, and effective monitoring and evaluation) available in TEVTA institutions.

Research Question 3: What are the perceptions of teachers and students about the effectiveness of teaching methods used to teach DAE students?

Methods of Teaching

Table 5

Descriptive Scores of Teachers and Students' Perceptions about Methods of Teaching used by Teachers in TEVTA Institutions

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	Teachers use instructional facilities/ A.V. aids.	Teachers	36.7	45.8	14.2	1.7	1.7	4.26	0.71
		Students	39.7	40.6	13.1	4.2	2.5	4.10	0.95
2	Teachers take interest in character building of students.	Teachers	40.8	46.7	10.8	1.7	-	4.25	0.71
		Students	47.5	39.4	5.0	4.4	3.6	4.22	0.98
3	Teachers use different methods of teaching to teach DAE program.	Teachers	38.3	51.7	8.3	0.8	0.8	4.35	0.69
		Students	41.1	45.6	7.5	3.1	2.8	4.19	0.90
4	Teachers are knowledgeable about requirements for courses and area of interest to them.	Teachers	46.7	44.2	7.5	1.7	-	3.76	1.06
		Students	43.3	41.9	8.9	3.6	2.2	4.20	0.90
5	Teachers have industrial experiences.	Teachers	27.5	40.0	15.8	15.0	1.7	3.76	1.06
		Students	32.5	43.1	14.7	6.4	3.3	3.95	1.01
6	Examination system is appropriate in colleges of technologies.	Teachers	20.8	55.8	6.7	13.3	3.3	3.77	1.03
		Students	44.4	43.9	7.8	2.2	1.7	4.27	0.83
7	There is coordination with industry to reinforce learning (site visits, exchange of staff etc.).	Teachers	44.2	33.3	17.5	5.0	-	4.16	0.89
		Students	35.6	39.4	15.3	6.4	3.3	3.97	1.03

Descriptive scores of teachers and students' perceptions about method of teaching used by teachers were shown in above table. It is indicated that majority of the teachers (82.5%) and students (80.3%) were agreed that "teachers use instructional facilities/ A.V. aids", moreover, (87.5%) teachers and (86.9%) students were agreed that teachers take interest in character building of students. It is indicated that (90.0%) teachers and (86.7%) students were agreed that "teachers use different methods of teaching to teach DAE program", (90.0%) teachers and (85.2%) students agreed on that "teachers are knowledgeable about requirements for courses and area of interest to them." Findings further revealed that (67.5%) teachers and (75.6%) students were agreed that "teachers have industrial experiences", (76.6%) teachers and (88.3%) students were agreed that "examination system is appropriate in colleges of technologies", (77.5%) teachers and (75%) students perceived that "there is coordination with industry to reinforce learning (site visits, exchange of staff etc.)." It is concluded from the above findings that teachers and students were satisfied with the methods of instructions delivering in TEVTA institutions to DAE students.

Research Question 4: What are the perceptions of teachers and students about the quality of assessment and evaluation strategies used by TEVTA regarding DAE program?

Assessment and Evaluation System in TEVTA Institutions

Table 6

Descriptive Scores of Teachers and Students' Perceptions about Assessment and Evaluation System in TEVTA Institutions

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	Proper weight-age is given to students' practical work in final assessment.	Teachers	32.5	50.8	10.8	3.3	2.5	4.07	0.89
		Students	28.9	52.8	9.4	5.8	3.1	3.98	0.94
2	Annual system of examination is suitable for colleges of technologies.	Teachers	20.8	49.2	10.0	10.0	10.0	3.60	1.21
		Students	43.1	41.7	10.0	3.3	1.9	4.20	0.89
3	There is a close liaison with industry.	Teachers	24.2	48.3	16.7	10.0	0.8	3.85	0.93
		Students	21.7	38.6	15.3	13.9	10.6	3.46	1.26
4	Proper students' promotion criteria are decided in advance.	Teachers	30.8	41.7	10.8	11.7	5.0	3.81	1.14
		Students	25.0	39.4	18.9	10.6	6.1	3.66	1.14
5	This institution periodically evaluates students' technical skill level to guide their learning experiences.	Teachers	28.3	51.7	6.7	10.0	3.3	3.91	1.02
		Students	33.3	35.3	16.1	5.8	9.4	3.77	1.23

Teachers and students' perceptions about assessment and evaluation in TEVTA institutions were investigated where (83.3%) teachers and (81.7%) students were agreed that "proper weight-age is given to students' practical work in final assessment", (70%) teachers and (84.8%) students were agreed that "annual system of examination is suitable for colleges of technologies." Moreover it is indicated that (72.5%) teachers and (48.3%) students were agreed on that "there is close liaison with industry", (72.5%) teachers and (60.3%) students were of the view that "proper students' promotion criteria are decided in advance", (80.0%) teachers and (68.6%) students agreed on that "this institution periodically evaluates students' technical skill level to guide their learning experiences." It is concluded that teachers and students were seemed to be satisfied with the process of assessment and evaluation (weight-age for practical, examination system, feedback, annual system of examination, and liaison with industry) decided by TEVTA.

Research Question 5: What are the perceptions of teachers and students about the effect of social factors on the quality of DAE program?

Social Factors

Table 7

Descriptive Scores of Teachers and Students' Perceptions about Social Factors

Sr. No	Statements	Respondents	SA	A	UD	DA	SDA	M	SD
1	The downfall on industry in Pakistan is due to scarcity of technical skilled labors.	Teachers	48.3	37.5	9.2	3.3	1.7	4.27	0.88
		Students	40.3	38.9	14.4	2.5	3.9	4.09	0.99
2	Society considers the DAE graduates as lower status.	Teachers	45.0	32.5	15.0	5.0	2.5	4.12	1.00
		Students	36.4	37.8	13.9	6.1	5.8	3.92	1.12
3	Development of Pakistan depends upon the quality of technical education.	Teachers	52.5	33.3	12.5	1.7	-	4.36	0.76
		Students	56.1	34.2	4.2	3.3	2.2	4.38	0.88

Teachers and students' perception regarding effect of social factors on DAE graduates was explored in above table. Findings of the study revealed that (85.8%) teachers and (79.2%) students were agreed that "the downfall on industry in Pakistan is due to scarcity of technical skilled labors" on the other hand (77.5%) teachers and (74.2%) students were agreed that "society considers the DAE graduates as lower status." Findings further revealed that (85.8%) teachers and (90.3%) students were agreed that "development of Pakistan depends upon the quality of technical education."

Qualitative Data Analysis

Seven experts from TEVTA were interviewed in order to investigate the planning of curriculum development for DAE students. Seven experts (General Manager Curriculum, Director R&D, Assistant Director R&D, District Manager, General Manager Academic and Audit Section, and General Manager Academics) from TEVTA were selected as participants of the study for interviews. Interviews were transcribed and themes were generated by using thematic analysis. Results are as following.

Research Question 6: What are the views of the TEVTA experts regarding DAE curriculum development process?

1. What is the process of curriculum development for DAE program?

Theme: Curriculum Development Process

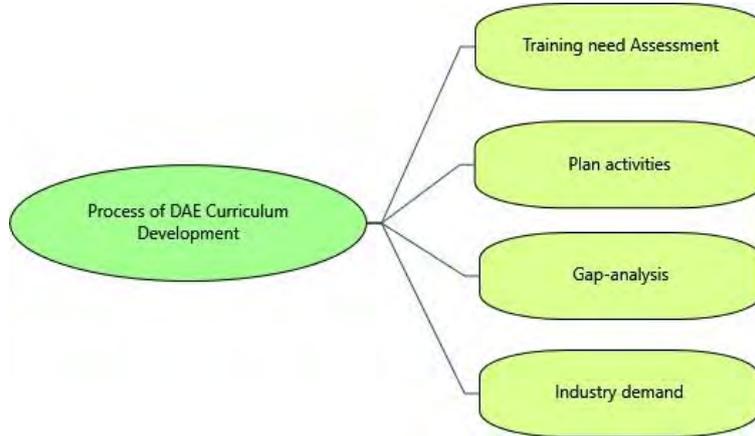


Figure 1. *Curriculum Development Process*

Majority of the respondents were of the view that when any institute starts a program, it starts from Training Need Assessment (TNA). This need assessment is done by research and development section of TEVTA. Then curriculum with the involvement of academia and industry is designed and developed by curriculum development committee. Academic wing revise its contents and gap-analysis is done by research and development department. One of the respondents said “*according to the demand of industry curriculum is developed and revised by curriculum development committee*”.

2. What are the strategies to prepare the draft of DAE curriculum by stakeholders?

Theme: Revision of DAE Curriculum

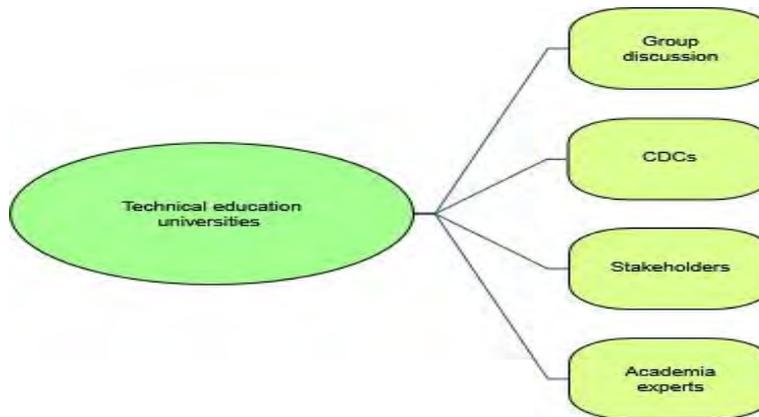


Figure 2. *Revision of DAE Curriculum*

P1 said that stakeholders i.e. concerned employers/ industry, alumni, current students and senior teachers are involved initially in TNA and Gap-Analysis process. Therefore, their input and feedback is considered during review / revision of DAE curriculum. P2 answered “*There are basically three stakeholders included for revision included Technical Education Universities (UETs), related industry and our alumni force working on different posts in different industries.*” P3 replied that stakeholders like teachers and technical experts are considered but students and parents are mostly neglected. P4 argued that stakeholders are called for seminars and group discussions about the courses or sometimes they visits industry for vetting the curriculum. P5 said “of course”, CDCs (Curriculum Development Committee) are developed before developing the draft of curriculum of DAE. Curriculum development committee involves fifty percent ratio from industry and fifty percent from academia. This committee made draft after TNA deliberately then draft is peer reviewed by industry. Industry involves in the process of finalizing the curriculum till end. P6 answered “Yes” we discuss everything with the stakeholders after completion of draft and they cooperate with us. P7 replied that “*once the draft is prepared then it is sent to different quarters, HODs and also in the fields to take the comments.*”

3. Is the need assessment made before initiating DAE program?

Theme: Need Assessment

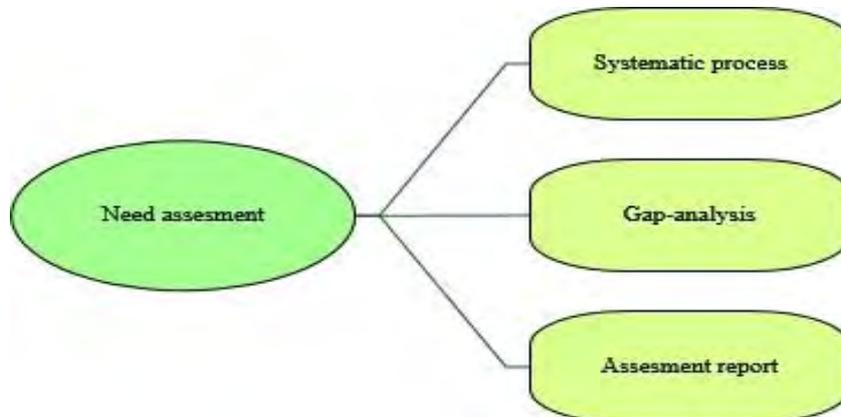


Figure 3. *Need Assessment*

P1 said that many DAE programs are being run in colleges/ institutes even since many years before inception of TEVTA. Hence, TNA/ Gap-Analysis is conducted prior to revision of course in order to chalk-out the skill matrix of required skills as per present market demand. However, if any new DAE is to be developed and launched, then detail TNA is carried out accordingly. P2 answered “Yes” without any doubt. Curriculum

whether it is to be taught for three months or three years it is always started after TNA. P3 replied “*definitely need assessment is done before assessment. I mean need assessment for DAE students are two different things.*” P4 said “Yes” of course, strictly. P5 replied “Yes” definitely, need assessment process is started with the involvement of industry. It cannot be completed without the industry involvement because we have to send our graduates in industry. P6 answered that they made need assessment report after detailed study in which analyze and manipulate available data by R&D which based on new future industrial trends and requirements. P7 said any program which is about to start requires need assessment. It must have been done before.

4. What do you think the relevant teachers are inducted for teaching the prescribed DAE course?

Theme: Teachers’ Induction

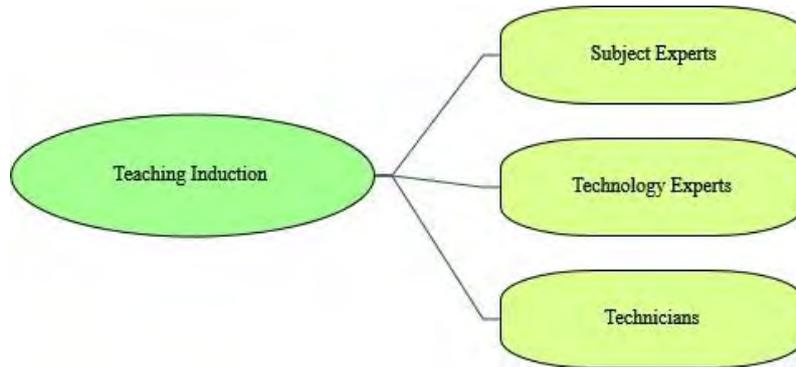


Figure 4. *Teachers’ Induction*

P1 replied that this mechanism is always necessarily followed. M.Sc. in Physics, Chemistry and Mathematics teachers are hired for relevant courses. MBAs and M.Sc. Economics teachers for managerial or communication subjects while relevant faculty Engineering/ B. Tech and DAEs for teaching and conducting practical of related technology subjects are hired. P2 said “Yes” obviously relevant teacher are hired. Specialized teaches like Physics, Mathematics, English etc. are inducted. P3 answered “Yes” it must be how you can say that teacher having qualification of MA Urdu can teach the subject of Physics. A teacher having qualification of civil can teach the subject of mechanical. Specialized teacher is the need of any subject to be taught. P4 said exactly, relevant teachers with relevant qualification are inducted. P5 replied “Yes” they inducted relevant teachers and relevant teachers are teaching to the students. There is no compromise on it. P6 also replied “Yes” definitely all relevant teachers are inducted for prescribed DAE program. P7 said “Yes” relevant teachers with relevant subject and relevant technology are hire.

5. Is the teachers' training made before initiating DAE program?

Theme: Teachers' Training

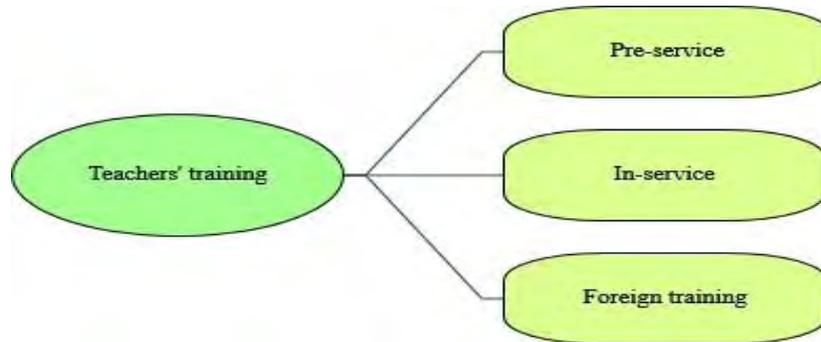


Figure 5. *Teachers' Training*

In this regard P1 said training of teachers (TOT) is a regular routine for both local and foreign for pre-service, in-service and post-service instructors whether technical and pedagogical. P2 was of the view that teachers are sent for the staff training to the institute of training. P3 said one month teacher training is conducted for every teacher at the time of recruitment. If a new curriculum is initiated in case of some new technology or skills is added yearly. It is called deficient skills. P4, P5, P6 and P7 answered that they have a functional department of teachers' training. Pre-service, in-service and refresher courses are planned for teachers. It is a continuous process of HRD in TEVTA. Teachers of civil technology should be civil literate and so on.

6. Are the resources (physical, human and financial) are appropriate for DAE program?

Theme: Resource Availability

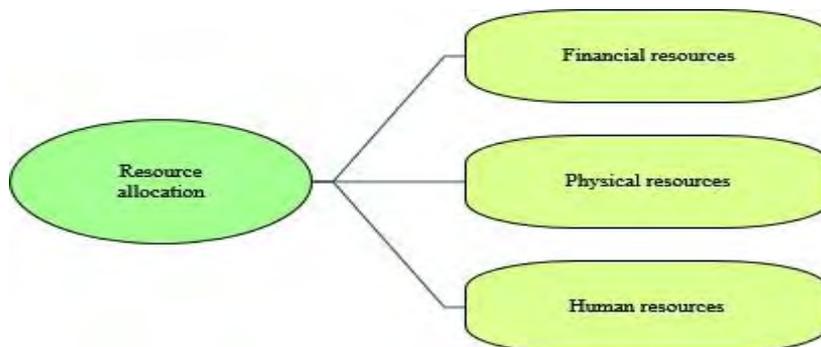


Figure 6. *Resource Availability*

P1, P2, P3, P4, and P5 argued that financial resources to purchase costly equipment and machinery are insufficient within the budget provided by the government, this deficiency is covered up to larger extent through industry collaboration and visits. Human resources in the form of teachers/ instructors and lab staff shows satisfactory picture as M.Sc. or B.Sc. Engineering as well as relevant technology diploma holders in labs. Whereas, P6 said whenever an institution is established under TEVTA, physical infrastructure, HR, financial resources are appropriately provided by its project department as per needs of technologies for DAE programs. P7 said physical, human and financial resources provided for this are more than appropriate. Unluckily, corruption works. So TEVTA and Polytechnic hardly gets half of that beyond the scope funds from international institutions like Asian Development Bank.

7. Is there any proper monitoring system available for DAE program by TEVTA?

Theme: Monitoring and Evaluation

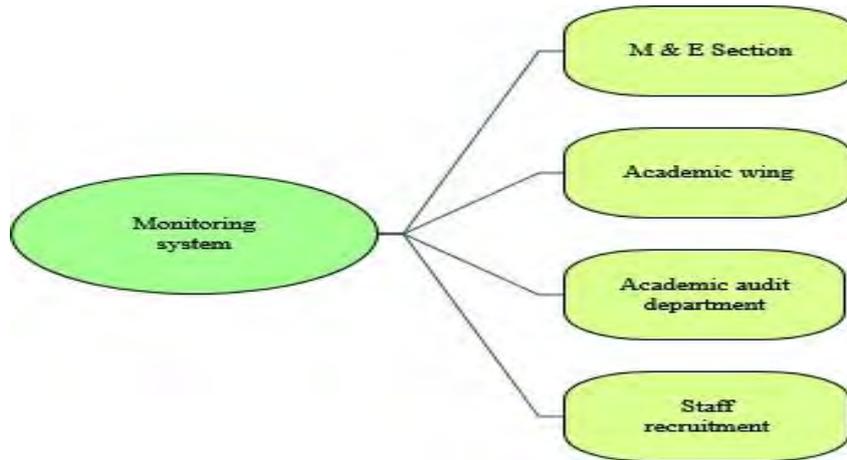


Figure 7. Monitoring and Evaluation

P1 argued that academic audit section is in place under academics wing since 2003 with parameters and checks on academic areas at GCTs. Where M&E section also further strengthens the same by monitoring and evaluation execution and operational part working under operations wing. P2 answered that a very strict monitoring is being done these days. New and complete departmental staff is hired for this purpose. P3 said DGM monitoring and evaluation is here for planning proper monitoring system. P4 said “Exactly, teachers’ evaluation, administrative level evaluation and institutional level evaluation system is available in TEVTA.” There is a proper monitoring and evaluation department which is responsible for monitoring and evaluation. P5 said “Yes” there is

proper monitoring system available for DAE program by TEVTA. Principals, district managers, Zonal managers, GM operation is a monitoring team in TEVTA which monitors the system. P6 said monitoring wing perform inspection on every level through principles, district managers and zone managers. P7 said yes, there is proper monitoring system available in TEVTA. Monitoring and evaluation department evaluates the institutional performances when needed.

Discussion

Technical education in Pakistan have significant role to produce skilled manpower for the development of the country. Like Pakistan many developing countries are relying on technical education. Therefore, technical education considers the need of present era of technology. The study aimed to evaluate the Diploma of Associate Engineers (DAE) program working under TEVTA. It is found that teachers and students were satisfied with the content of curriculum, Urdu as a medium of instruction, theory and practical ratio, curriculum as skill oriented, participation of students in co-curricular activities and industrial tours arranged for students, infrastructure, maintenance of buildings, computer facilities, transport facilities, hostel facilities, library facilities, books availability, tools, employment opportunities, guidance and counseling facilities, strict merit, and effective monitoring and evaluation, teachers teaching methods, teachers' experience in industry, knowledge, site visits, examination system and assessment system of TEVTA. The findings of the study were also supported by the qualitative study where TEVTA experts argued that the facilities were provided by the authorities and they are using those facilities for the betterment of the students. Findings of the study were aligned with the findings of Shah (2004). Same results were reported by Advisio (2003).

On the other hand the teachers and students were not seemed to be satisfied with English as a medium of instruction, equipment in labs, fire-fighting facilities, linkage with industry, and social well-being. Qualitative findings of the study also supported the quantitative finding where experts were agreed that that financial resources to purchase costly equipment and machinery are insufficient within the budget provided by the government, this deficiency is covered up to larger extent through industry collaboration and visits. for DAE graduates. Findings of the study were supported by the findings of Shah (2004) who concluded that there is no proper physical infrastructure, facilities, linkage with industry, social acceptance of DAE graduates, examination system, scholarships for students and delay of resource allocation and improper monitoring system in TEVTA. Kazmi (2007) in a previous research identified the importance of institution-industry linkages. She claims that these relationships are necessary to meet the challenges of globalization.

Participants of the study were seemed to be satisfied with the curriculum developed by curriculum development committee of TEVTA, need assessment, teachers' induction and training, teachers' competencies, monitoring and evaluation system, whereas they were not seemed to be satisfied with the resource (human, financial and physical) available for the said diploma. The qualitative findings were supported the quantitative findings of the study where experts concluded that curriculum is enough to develop DAE students' technical skills, and teachers' training is satisfactory. Furthermore, there is proper monitoring and evaluation system in TEVTA and there are not enough physical, human and financial resources for DAE program in province Punjab. Findings were supported by Shah (2004) that technical education is lacking link with industry and resources provided to the technical institutions.

Conclusion

It is concluded that teachers and students were satisfied with the DAE curriculum, Urdu as a medium of instruction, theory and practical ratio, curriculum as skill oriented, participation of students in co-curriculum activities and industrial tours arranged for students, infrastructure, maintenance of buildings, computer facilities, transport facilities, hostel facilities, library facilities, books availability, tools, employment opportunities, guidance and counseling facilities, strict merit policy, and effective monitoring and evaluation, teachers' teaching methods, teachers' experience in industry, knowledge, site visits, examination system, and assessment system in TEVTA. On the other hand the teachers and students were not seemed to be satisfied with the English as a medium of instruction, equipment in labs, fire-fighting facilities, and social well-being.

Recommendations

Recommendations of the study are as following.

1. DAE curriculum is appropriate but not fully implemented due to lack of labs facilities. Therefore, it is recommended that more emphasis should be given to overcome the deficiency of curricula compliant labs.
2. Labs should be fully equipped with the required material in order to develop technical skills among DAE students.
3. Teachers' should be expert in their relevant technology; teachers training, workshops, and seminars would be conducted by TEVTA in this regard.
4. Language barriers are the big hurdles among DAE students' understanding the study material, therefore the students' language ability need to be enhance for better understanding the learning material.
5. There should be Linkage between Colleges of Technologies and industry to produce skilled labor force in the country.

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