

## **Effectiveness of Technical and Vocational Education: A Meta-Analysis**

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### **KEY WORDS**

Technical education,  
Meta-Analysis, Technical  
Skilled Labour, Resources,  
Outdated Curriculum, OJT

### **ABSTRACT**

The study aimed to assess the effectiveness of Technical and Vocational Education (TVET) in Punjab by using meta-analysis technique. The data were synthesized by comparing research with a common focus (Paterson et al., 2011). After the initial literature search, more stringent inclusion and exclusion criteria were applied. It revealed that the training institutes somehow failed to improve the livelihoods of the rural locality due to a lack of funds for the training materials, tools, equipment, and other relevant necessities. For the training institutes to have a greater influence, the study found that it required a clear goal, strategic planning, objectives as well as successful implementation and sufficient money from the government. The curriculum of TEVT was good but its linkage to industry was found to be weak and internships were not adequately managed.

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### **Introduction**

Entrepreneurs' ability to produce goods and services of higher quality at lower prices is critical to the success of any nation's economy. Developing countries, including Pakistan, according to Khan (2005a), must endeavour to improve their technical education systems. Knowledge and understanding of general education, the study of technology, as well as practical skills and attitudes, are essential for success in the social and

economic sectors. Therefore, it is essential to have both a broad education and technical training (Mouzakitis, 2010). Non-formal learning methods and literacy programmes need to be integrated into national education systems, and that is exactly what TEVTA is working to do in Pakistan and other developing countries where a huge number of young learners are excluded from formal education systems.

The development of a country's economy relies heavily on technical and vocational training (TVE). Having people who are well-educated and skilled has a direct impact on the well-being of a society. The expansion of technical and vocational education is critical to helping students reach their full potential. As technology has progressed rapidly around the world, the need for technical education has increased in importance. Prioritizing technical and vocational training for Pakistan's future prosperity is a dangerous move (Kazmi, 2007; Tanveer, 2015). This year's national education policy acknowledges the importance of technical education in providing students with the skills they need to find work. In Pakistan and overseas, those with technical skills are in a better position to get a job. Multiple difficulties confront Pakistan's education system (Memon, Joubish, & Khurram, 2007).

Province-to-province differences exist in the advancement of technical and vocational education. A number of initiatives have been implemented by the federal government and four provinces in order to reap the benefits of technical and vocational education. Since Punjab's economy is heavily industrialized, the province's technical and vocational education system has been shaped by this. Education in the technical field has as its primary goal, the preparation of students for successful careers in the labour market and as a contributor to national economic progress (Khan, Amjad, & Din, 2005). Improved quality of training, adequate facilities, infrastructure for training and equipment, as well as links between educational institutions and industry are all critical to a strong technical education system. TEVTA

is projected to open up new job prospects for people of all ages and backgrounds, allowing them to keep their financial footing and find respectable jobs. Evidence shows that employment is linked to skill levels and other human capital formation factors in TEVTA-related studies.

In Pakistan, the National TVET Policy (2018) sets eight goals for skill development. In addition to these eight goals, the development of skills, particularly among young people, aims to increase productivity, sustain economic growth, improve job opportunities, target a milestone of 20 million TVET skilled workers, up-skilling and re-skilling, export of skilled labour and achieve the demand for skilled workers on the labour market.

There is an enough need for education in skill and profession all across the world. One of the many explanations for why persons with a TVE earn more than those without one is because TVE prepares students for careers in the technical and vocational fields. As compared to those who have a general education, those with technical or vocational training are more likely to find work. As a result, TVE eliminates inequality and poverty by increasing the efficiency and competence of the entire populace (Olaitan, 2012). TVE helps students get the knowledge, abilities, and methods necessary to land a job (Pauline, 2008). Individuals benefit from TVE in the form of a better economy and a higher quality of life as a result of TVE. In Pakistan, there is a shortage of skilled and semi-skilled workers. TVE should consequently be given greater priority in educational curricula (Khwaja, 2009). Federally, Pakistan has NAVTTC, and provincially, TEVTA, both of which provide technical education and vocational training in Pakistan (Tushar 2013). TVE is offered in Punjab by the Punjab Vocational Training Council and certain businesses via workshops.

Many fast-expanding industries are experiencing acute shortage of trained labour because of global economic transformations in reaction to technological improvements, which have increased the demand for professional workers. To fill the gap between industry's need and supply, a

large number of expats have been brought in from countries including the United States, Canada and Australia (Kizu et al., 2018). The mismatch between slow economic growth and a growing population is a major problem for emerging economies. Closing the gap between educational output and the labour market's needs is essential for long-term economic growth (Bilboe, 2011). According to Igarashi and Acosta (2018) the technical vocational training in developing nations has been found to yield larger financial returns than general education whenever the labour market expands and training is closely related to available opportunities.

Changes in attitudes about the value and nature of vocational and technical education, as well as about the nature of vocational and technical education itself, are a result of rapid technological, economic, social, political, and educational upheaval. Government's ability and readiness to improve job desirability in private sector while concurrently raising natives' inclination towards the work. In the report 2017 the World Bank mentioned the two key factors aimed to raise employment level in Gulf States.

An ability to produce high quality goods and services at low cost is critical for economic growth (Mouzakitis, 2010). In an era of rapid technological advancement and a growing worldwide setting, it is difficult for both developed and emerging countries to train brilliant people in a professional, beneficial manner. Progress in technical education has become critical for emerging countries like Pakistan. The ability of a country to produce high-quality goods and services at lower prices is essential to economic growth (Mouzakitis, 2010).

The TVET sector in Pakistan is a fantastic asset for addressing some of Pakistan's most pressing challenges, such as bridging the skills gap and reducing unemployment. According to policymakers and decision makers in government, TVET is less essential than general education, resulting in a shortage of competent professionals (Shakir, 2020). A pessimistic view of the TVET sector has the unintended consequence of deterring investment in

training new workers because the industry is seen as of low quality and yielding low returns (Shah, 2017). According to Lodhi (2019) these pessimistic expectations have resulted in a decline in funding for vocational and technical education and training (TVET) institutions as a result of a lack of finances for teacher training, curriculum revisions, and the necessary equipment for skill development.

As a result, it is stated that Pakistan's current TVET system does not meet the needs of the country and the global economy. Concentration in the private sector, which has no minimum educational requirements, has led to a rise in the number of skilled workers available on the job market, which has resulted in imbalances in the workforce (Khan & Zaib, 2017). An overwhelming majority of competent workers are still without jobs, and companies routinely complain about a lack of qualified workers due to outdated curricula supplied by TVET colleges, according to a widely held notion (Fatima et al., 2020). A well-trained workforce is essential for long-term economic growth in both developed and developing countries. These countries are thriving in global labour market due to the large investment in skill development, and enjoying both economic and social benefits from their efforts to improve their workforce (Kanwal, Balasubramanian, & Carr, 2019).

Most developed countries have gained economic prosperity as a result of innovation. Government policies and economic development plans in Pakistan show that the country places a high priority on technical and vocational education and training (TVET). After the country's declaration of independence in 1947, the country's founder, "Quaid-e-Azam Muhammad Ali Jannah," made it clear that vocational, technical, and scientific education was needed (Shah, 2004). "Pakistan's policies and growth plans were all made with the political goals of the same ruling party in mind, which had a long-term detrimental impact on the nation's financial situation" (Rashid & Mukhtar, 2012). Pakistan's previous prime minister funded an initiative to

train 1 million people with 2 billion Pakistani rupees (2006-2013), which was supported by the government. This programme has received negative feedback, but no revisions have been made as of yet (Chamadia & Shahid, 2018). To some extent, the educational system likewise changed on the eve of such political implications in accordance with predefined destinations (Hassan, Ahmad, & Siddiqui, 2019; Khan & Zaib, 2017). In light of current TVET reforms and their execution, a new stage dubbed "TVET reforms and implementation" has been added to this project's progression. According to Pakistan's TVET history, the Education Policy (1972-80) recommended a significant transition from general education to the term "world of labour". As a result, there was an increase in the number of students enrolled in agro-technical studies, farming, and home economics courses across the country (Ali et al., 2017). On the other hand, financial aid from a number of international donor organizations helped Pakistan's TVET sector grow and expand significantly in the 1970s and 1990s.

### **Statement of the Problem**

There is dire need to analyze the effectiveness of technical education along with the increasing demand of technical skilled labours and the establishment of new technical institutions with the rapid change of technology in the World. The present study focuses on assessing the effectiveness of technical education by using meta-analysis technique. Reason for analyzing the effectiveness of technical education particularly in Pakistan is that the students, parents and society do not know the long term benefits of technical education. The enrollment rate is low in technical education. People consider it low status education in society because of weak institutional architecture, the environmental restrictions, its costs and benefits, assets, resource management, working conditions, and several other aspects affect institutional performance. Therefore, the present study attempted to examine the effectiveness of technical education by meta-analysis technique.

### **Significance of the Study**

Through the eyes of both teachers and students, this study provides useful information for educators and policymakers alike on how well students are acquiring specific skills, as well as the characteristics of the teaching-learning process. It is hoped that by doing this research, government officials will be able to assess the effectiveness of technical education and determine the necessary resources and instructional materials as well as the costs and advantages associated with them. The findings of this study will aid administrators in making the necessary adjustments, additions, and deletions to improve the effectiveness of technical education. In addition, teachers will be able to use this study's findings to make better decisions on how to help their pupils improve their skills. Results of this research could be utilized as a foundation for improving technical education and providing useful insights into its effectiveness. Furthermore, the teaching and learning process relies heavily on the growth of students' abilities. Prior to entering a preparatory college, students should be able to demonstrate the talents will need to succeed. Therefore, it is critical to learn what students believe about the emphasis on skill development and how they view their own competencies. Aside from providing information on the costs, advantages, resources, teaching techniques, assessment and communication opportunities of technical education in addition to the recommendations to improve the identified weaknesses in technical institutions.

### **Objective of the Study**

1. To explore the effectiveness of technical and vocational education in Pakistan using meta-analysis approach.

### **Research Question**

To what extent technical and vocational education plays a significant role in economic growth of a country?

## Methodology

The study aimed to assess the effectiveness of Technical and Vocational Education in Punjab by using meta-analysis technique. “In meta-analysis, the data are synthesized by comparing research with a common focus (Paterson et al., 2011). After, the initial literature search, more stringent inclusion and exclusion criteria were applied. Noblit and Hare’s (1988) steps broaden understanding of the data collected from studies in the literature”.

**Phase 1: Getting started:** Several decisions were made along the course of the investigation to confirm the study's goal. Everything from deciding which articles to use for determining what information is important to the study is done here. One hundred and seventy-seven articles on the efficiency of vocational and technical education were examined. This meta-data analysis has more validity because of the rigorous evaluation of each study. Synthesizing the findings adds to the study's value by providing a new perspective. In order to begin the meta-data analysis, the researcher looked for previous studies that had addressed topics that were almost identical to her own. Research Gate, ProQuest, and ERIC databases were scoured for information on technical training. TQM journal, Bulletin for Education & Research, Global Regional Review and Global Educational Studies Review are among the journals in the field of education that are included in this list. The journals include: European Scientific Journal (ESJ), TQM Journal (TQM), Bulletin for Education and Research (BER), Global Regional Review and Global Educational Studies Review.

From 2010 to 2022, 17 peer-reviewed academic publications on the efficiency of technical education were uncovered (see Table 1). Using only studies in which students provided their own statements, relevant research was uncovered. It was decided not to include studies that relied on author statements. There was also a slashing of vocational education. There may be a difference in experiences and perceptions between respondents with



vocational training and those with technical training. Respondents are not eligible for inclusion if it is not made clear in the article that they are from a vocational school.

Table 1

*Total Studies Searched*

Sr#	Search Themes	No. of Articles
1.	Technical and Vocational Education	12
2.	Technical Education Diploma	5

**Phase 2: Deciding what is relevant:** After doing a preliminary literature review, certain inclusion and exclusion criteria were outlined. They axed all academic writings such as dissertations, books, and conference papers.

There was some thought given to studies examining the usefulness of vocational training. In order to answer the research objectives and include empirical evidence of the perspectives and experiences of technical education's effectiveness, six studies based in Pakistan were examined.

**Phase 3: Reading the studies:** Six research studies meeting the relevant criteria were read repeatedly by the researchers.

Table 2

*Population of the Study*

Author	Sample Size	Method	Country	Discipline
Shah, Ajmal, & Rahman (2010)	40 Experts 35 Principals 350 Students	Quantitative	Pakistan	Education
Shah, Rahman, Ajmal, & Hamidullah (2011)	100 Respondents	Quantitative	Pakistan	Education
Bappah & Medugu	84 Indigenous and 72	Quantitative	Malaysia	Education

Author	Sample Size	Method	Country	Discipline
(2013)	Multinational Employees			
Magaji (2015)	Curriculum Review		Malaysia	Education
Rasul, Ashari, & Azman (2015)	Federal government reports, proceeding papers, journals and electronic references	Qualitative	Pakistan	Education
Ayub (2015)	25 Technical and 25 Vocational Students	Quantitative	Pakistan	Economics
Alam (2015)		Quantitative	Malaysia	Scientific Journal
Baraki & Kemenade (2016)	Policy/program documents, performance reports and learning outcome achievement results of TVET graduates at national and regional level	Qualitative	Netherlands	TQM
Bakhsh, Rasool, Mohsin, & Hussain (2016)	150 instructors 20 Industry Managers	Mixed-Methods	Pakistan	Education
Elebute, Mashood, & Shagaya (2016)	Case Study (historiography)	Qualitative	Nigeria	Education
Makura, Mweha, & Chikwiri (2016)	Not Provided	Qualitative	Zimbabwe	Education

Author	Sample Size	Method	Country	Discipline
Ahmed, Khan, Shehnaz, Muhammad, & Walliullah (2018)	Policies and skill development documents at national and provincial levels.			
Siddiqui, Hameed, Akbar & Mumtaz (2019)	494 Parents	Quantitative	Pakistan	Economics
Gull, Hashmi, & Altaf (2019)	120 Instructors	Quantitative	Pakistan	Education
Gull & Hussain (2021)	143 Employees	Quantitative	Pakistan	Education
Gull & Hussain (2021)	360 prospective Associate Engineers, 120 teachers and 07 experts	Mixed-Methods	Pakistan	Education
Gull, Abid, Altaf, & Hussain (2022)	Private Cost Public Cost Benefits	Quantitative	Pakistan	Education

The above table shows the studies consulted by the researcher to find the answer of the research question. Therefore, six research studies meeting the relevant criteria were read repeatedly by the researchers.

Table 3  
*Sample of the Study*

Author	Sample Size	Country	Discipline
Shah, Rahman, Ajmal, &Hamidullah (2011)	100 Respondents	Pakistan	Education
Baraki&Kemenade (2016)	Policy/program documents, performance	Netherlands	TQM

Author	Sample Size	Country	Discipline
	reports and learning outcome achievement results of TVET graduates at national and regional level		
Makura, Mweha, & Chikwiri (2016)	Not Provided	Zimbabwe	Education
Siddiqui, Hameed, Akbar & Mumtaz (2019)	494 Parents	Pakistan	Economics
Gull & Hussain (2021)	143 Employees	Pakistan	Education
Gull, Abid, Altaf, & Hussain (2022)	Private Cost Public Cost Benefits	Pakistan	Education

This process began by ensuring that each study's uniqueness was preserved before moving on to synthesizing the data. Quantitative and qualitative methods were used in all five research. 'Situation analysis of technical education and vocational training: A case study from Pakistan' was the approach taken by Shah, Rahman, Ajmal and Hamidullah (2011) in their study. In another study "Effectiveness of Technical and Vocational Education and Training (TVET)" Baraki & Kemenade (2016) employed secondary data; this descriptive case study incorporates Pawson and Tilley (1997)'s realistic assessment approach with Total Quality Management (TQM) framework. According to Makura, Mweha, and Chikwiri (2016), policy documents were used in their study "The Effectiveness of Vocational Education and Training on Sustainable Development." The authors of "An Investigation of the Effectiveness of Technical and Vocational Education in Pakistan," Siddiqui, Hameed, Akbar, and Mumtaz (2019), employed descriptive research methods. The efficiency of TEVTA's Diploma of Associate Engineers (DAE) programme in Punjab was studied by Gull and Hussain in 2021, using descriptive research. Cost-benefit analysis of the

Diploma of Associate Engineers was studied by Gull, Tamour, Altaf, and Hussain in 2021 (DAE).

**Phase 5: Synthesizing translations.** It is time for a new degree of investigation in the following step. See whether there are any recurring themes or words that appear in all five studies. A cross-analysis of the separate research was conducted to determine the most important themes that emerged from the findings. Research on the effectiveness of technical education and its role in economic development at the national and international levels was conducted by the researcher, who chose two national and four international studies.

**Phase 6: Expressing the Synthesis.** In the findings and discussion parts of the five studies, we discussed common themes that flowed through metaphors, ideas, concepts, and key phrases using thematic analysis.

**Results**

**Major Theme: Technical Education**

Table 4

*Technical Education*

Sr#	Major Theme	Sub-Themes
1.	Technical Education	Outdated Curriculum, Physical, Financial, Human Resources, Better Job Opportunities, Compliant Labs, Teachers Guide and Manuals, Sustained Economic Growth, Facilities, Technical skill, On Job Training, Social Awareness, Assessment and Evaluation, Job Opportunities and Cost-Benefit

The purpose of the present was to assess the effectiveness of Technical and Vocational Education (TVET) in Punjab by using meta-analysis technique. The major theme was extracted from the study is

technical Education and sub-themes were Outdated Curriculum, Physical, Financial, Human Resources, Better Job Opportunities, Compliant Labs, Teachers Guide and Manuals, Sustained Economic Growth, Facilities, Technical skill, On Job Training, Social Awareness, Assessment and Evaluation, Job Opportunities and Cost-Benefit. The primary goal of this study was to conduct a meta-analysis about the effectiveness of technical education. Researcher-selected studies have yielded the following findings. Shah, Rahman, Ajmal, and Hamidullah (2011) found that technical education and vocational training in Pakistan (Punjab) was effective. It meets the demands of industry, students, and the employer, and it was widely accepted. In order to continue their education or find work, the graduates have acquired the necessary skills. Training provided by TEVTA for teachers in the field has proven to be successful. TEVT's curriculum was determined to be adequate, but more work has to be done on industrial training and establishing stronger ties between the school and industry. The in-service training provided to the teachers of Technical Education and Vocational Training institutions was successful. Teachers who took part in training were able to use the strategies they learned in the classroom to improve their own teaching. Researchers found that there was a shortage of lab and shop supplies and furniture as well as of consumable training materials and finances in their study. The most up-to-date gear and equipment can be installed in the laboratory and retail locations. Consumable materials, repairs, and maintenance should be prioritized in the budget. Teachers had to deal with housing issues, a lack of performance incentives, a lack of exposure to other cultures, as well as a lack of physical resources. Staff training and adequate funding can help solve these issues.

There is a positive correlation between parents' perceptions of the efficacy of technical and vocational education and poverty alleviation, according to a study published in 2019 entitled "Effectiveness of Technical and Vocational Education and Training (TVET)." The rural parents'

perceptions of academic facilities, curriculum, assessment & evaluation, and social component elements are greater than those of urban parents. In terms of physical amenities, however, there was no difference in location; parents' judgments were that TVE is successful in alleviating poverty regardless of age difference. Parents' views on technical and vocational education's effectiveness and the reduction of poverty were found to have a substantial beneficial association. The outcome variables poverty alleviation for the success of secondary technical and vocational education are strongly and positively predicted by curriculum, assessment and evaluation, and social elements.

Key components of a quality outcome-based TVET programme are found in macro-level components, according to Baraki and Kemenade (2016). Through its components the TEVET program promoted the quality of technical education likewise, framework of TEVET qualification, accreditation, professional standards and assessment, monitoring, participation of stakeholders, partnership, and many other supportive systems of standard-based TVET delivery. The macro-level implementation of the programme mechanisms is proceeding in accordance with the programme plan. The supportive and regulatory frameworks are established. We'll have to wait and see if these techniques have the desired effect in the long run.

It is possible to draw certain conclusions from the study of Makura, Mweha and Chikwiri (2016). It reveals that the government must make a concerted effort to help the graduates of the center who come from low-income backgrounds start their own businesses. As a result, untrained rural residents in the District would be able to find work and benefit from lower-cost goods and services thanks to the graduates' increased entrepreneurial activities in the area. DAE employees were happy with their work environment and the DAE curriculum, physical facilities, and administrative facilities, according to Gull and Hussain (2001). Staff were dissatisfied with

the evaluation processes in place and other social variables that impacted work environments. The effectiveness of the (DAE) programme was rated by employees differently depending on where they worked, what they did, and what they did as compared to the curriculum, assessment and evaluation system, and the effect of social variables of diploma in the organizations in which they worked, employees' perceptions of administrative facilities and social aspects were shown to be significant. Employees' views on physical facilities and social variables varied by age, but there were no age-related differences in their views on the DAE curriculum, assessment and evaluation system, or impact of social elements in the organizations where they worked.

In a cost-benefit analysis of the DAE programme, Gull, Tamour, Altaf, and Hussain (2021) found that TEVTA's Diploma of Associate Engineers (DAE) curriculum had different benefits and drawbacks. The expenses and benefits of obtaining a Diploma of Associate Engineers have been proven to vary (DAE). Data shows that students who complete the DAE programme have an advantage over those who complete a degree that takes 12 or 14 years to complete. It is obvious that the students who have qualification of inter and graduation cannot get the job of scale fourteen as compared to the diploma holders.

### **Discussion and Conclusion**

The study findings showed the curriculum of TEVT was good but its linkage to industry was found to be weak and internships were not adequately managed, as stated by Shah, Rahman, Ajmal and Hamidullah (2011) Those graduating were also deemed to be unprepared for the workforce. The findings of the study are reinforced by Shah (2004), who found that there is no linkage with industry and no career chances for graduates of technical schools. It was revealed that the Center's training failed to improve the livelihoods of the rural locality due to a lack of funds for the training materials, tools, equipment, and other relevant necessities. For the Center to have a greater influence, the study found that it required a



clear goal, strategic planning, objectives as well as successful implementation and sufficient money from the government. Research by Shah (2004) and Gull, Hashmi, and Altaf (2019) also supports the findings of this study, which indicated that there are no appropriate training possibilities, particularly overseas trainings. In addition, it is discovered that technical education receives no adequate support. There are no adequate facilities in remote locations, such as compliance labs, professional teachers, training, and so on.

Differences of parents' perceptions regarding effectiveness of technical and vocational education were existed significantly along with poverty reduction. This was found by Siffique, Hameed, Akbar and Khan (2019). The outcome variable poverty alleviation was strongly and positively predicted by the curriculum, assessment and evaluation, and social elements. Gull and Hashmi (2019), and Gull and Hussain (2021) reported that the curriculum is sufficient to enhance students' technical skills, while Shah (2004) observed that the curriculum is obsolete and that there is no monitoring system. TEVTA has a comprehensive monitoring system in place.

DAE curriculum, physical facilities, and administrative facilities were found to be satisfactory by Gull and Hussain (2021). Staff were dissatisfied with the evaluation processes in place and other social variables that impacted work environments. The effectiveness of the (DAE) programme was rated by employees differently depending on where they worked, what they did, and when they did. Compared to the DAE curriculum, assessment and evaluation system, and the effect of social variables in the organizations in which they worked, employees' perceptions of administrative facilities and social aspects were shown to be significant. Employees' views on physical facilities and social variables varied by age, but there were no age-related differences in their views on the DAE curriculum, assessment and evaluation system, or impact of social elements

in the organisations where they worked. Shah (2004) stated that the curriculum is outdated, there is no sufficient training, and there are no job chances for graduates. Ethiopia's TVET system, according to Baraki (2016), embraces and adapts internationally best practises. The proportion of formal TVET graduates who were recognized as competent by the evaluation and certification system improved from 17.42% in 2009/2010 to 40.23% in 2011/2012 following the execution of the 2008 TVET plan. Despite this, regional differences do exist. The study by Gull, Tamour, Altaf, and Hussain (2021) found that the cost and benefit of a Diploma of Associate Engineers differs from one another (DAE). Findings also revealed that students have long term benefits having qualification of twelve and fourteen years.

### **Recommendations**

Following recommendations were drawn in this study.

1. The teaching faculty should be hired who have knowledge and skills to train the students according to the industry demand.
2. Laboratories should be well equipped with apparatus to develop skills among students.
3. The government may create job opportunities and ensure job securities for the graduates.
4. The government may organize On Job Training (OJT) for students to improve the organization's standards.
5. Teachers have the problems of shelter, insufficient basic needs of lives, lack of national and global exposure of research. All these factors may effect of their performance. These problems may be overcome by staff professional development and through proper funding.
6. The parents should inform to the school management about the lack of physical and academic facilities.

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