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An Analysis of Teachers' Perception Towards Vocational Education and Training in India

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Abstract

Purpose: The study aims to explore the role of teachers in the successful implementation of Vocational Education and Training (VET) programmes in India. It focuses on understanding how teachers contribute to these programmes, the challenges they face especially in terms of training, infrastructure, and curriculum relevance and the support needed to enhance their effectiveness in bridging the gap between academic learning and skill development.

Methodology: The study employed a survey-based approach, collecting responses from 155 vocational teachers teaching Grades 9 to 12 across schools in seven states and three Union Territories which includes Daman & Diu, Dadra & Nagar Haveli, Gujarat, Haryana, Jammu & Kashmir, Meghalaya, Puducherry, Sikkim, Telangana, Tripura and West Bengal. The data gathered offered the experiences, needs and perceptions of teachers involved in VET programmes.

Findings: The findings highlight the role of teachers as facilitators of vocational education. It shows that the importance of empowering teachers through adequate training, resources, and industry collaboration to ensure the success and sustainability of VET initiatives in India.

Unique Contribution to Theory, Policy, and Practice: This study contributes to the theoretical understanding of teacher agency in vocational education, emphasizing their central role in the success of VET programmes. On the policy front, it advocates for targeted interventions in teacher training, curriculum design, and infrastructure investment. Practically, the findings support the development of collaborative models involving schools, industries, and government bodies to create a more responsive and effective vocational education ecosystem in India.

Keywords: *Vocational Education, NEP 2020, Training, Curriculum, Industry Collaboration, ICT.*

Introduction

Vocational Education and Training (VET) has developed as an important component in closing the gap between academic education and the skill requirements of the labor market. Given the speed at which technology is developing and the increasing need for qualified workers, India has realized how important it is to incorporate vocational education into the regular curriculum. This is further highlighted by the National Education Policy (NEP) 2020, which sets high standards to increase students' exposure to the workforce. When VET programs are implemented well, they can greatly lower unemployment, encourage self-reliance, and aid in the growth of the national economy.

Teachers are one of the most important stakeholders in the success of VET programs. In addition to teaching technical and vocational knowledge, they also influence students' perspectives on skill-based learning. However, obstacles including inadequate infrastructure, out-of-date curricula, a lack of industry exposure, and inadequate training make it difficult for teachers to carry out their jobs well. How prepared and motivated teachers are to provide hands-on, career-focused instruction is a major factor in the quality and applicability of vocational education.

The purpose of this study is to assess how vocational education and training programs are being implemented in India, with a focus on the role of teachers. It looks at the ways in which educators support these programs, the difficulties they encounter, and the resources at their disposal. The study aims to pinpoint opportunities for development and offer recommendations for boosting the teaching component within the VET framework by examining their experiences and viewpoints.

Thus, creating a sustainable and significant skill development ecosystem in India requires an appreciation of the role that teachers play in vocational education. VET programs can be implemented more effectively and students can be given the skills they need to succeed in the modern workforce by strengthening teacher training, boosting resources, and strengthening teacher-industry links.

Need of the Study

Despite numerous programs and policy measures to support Vocational Education and Training (VET) in India, there are still a number of obstacles to overcome in its implementation, especially at the school level. The teachers who teach vocational subject are among the most important elements affecting these programs' effectiveness. Many teachers lack the industry exposure, tools, and training necessary for successful skill-based learning. Improving the quality and results of VET requires an understanding of their function, difficulties, and support networks. As a result, this study is required to investigate the practical realities of VET implementation from the viewpoint of the teachers and to recommend actions that can improve their ability to provide vocational education.

Review of Literature

Several studies have explored the effectiveness and challenges of vocational and educational methodologies across various domains. Saini (1978) compared programmed learning with traditional textbook methods for teaching sociological concepts, finding programmed learning more effective regardless of student gender or intelligence. Verma and Saraswathi (1983) evaluated child development curricula, highlighting key competencies like human behavior understanding, communication skills, and cognitive abilities, while stressing the need for more culturally relevant content.

D'lima and Puri (1985) found value-oriented education improved students' attitudes towards righteousness and selflessness. Mishra (1985) identified poor basic skills, lack of local resources, and mismatched teaching methods as issues in work experience education in Assam. Dhote (1991) reported implementation challenges in Maharashtra's vocational education programme, including inadequate materials and training. Similarly, Das (1991) studied vocational interests of teachers, noting significant urban-rural and gender-based differences.

Biswal and Premananda (1992) evaluated vocational education at the +2 level in Himachal Pradesh, noting infrastructure and staffing deficiencies. Guru, Dhote, and Ray (1992) echoed similar implementation issues in Andhra Pradesh, despite committed educators and innovative practices. Archana (1997) emphasized that vocational education in India was failing due to untrained teachers and irrelevant courses. Arora (1999) stressed the need to align vocational courses with societal demands and improve selection processes, resources, and teacher training.

Balasubramanian (2002) recommended integrating computer education in teacher training programs to bridge the digital divide between private and government schools. Chhikara and Singh (2002) evaluated the impact of institutional vocational training, identifying human resource management and methodology as key performance factors. Curtin et al. (2011) underlined the link between innovation, skills, and vocational education's role in productivity, while McLaughlin and Mills (2011) showcased a successful dual-qualification model combining vocational and higher education in Australia.

Gandhi (2012) evaluated vocational education in Tamil Nadu, recommending stronger school-industry linkages for practical training. Eichhorst et al. (2012) offered a global perspective on vocational systems, comparing school-based, dual, and informal training models and their effectiveness. Sindhi (2013) discussed skill gaps in Indian vocational education, advocating for program strengthening to enhance employability. Joseph (2017) explored techno-pedagogical integration in Social Science teaching through the TPACK framework, highlighting the evolving role of ICT in education.

Sandu and Sharma (2020) applied Six Sigma methodologies like DMAIC to vocational education to improve quality and student satisfaction through better management practices. Pasaribu and Harfiani (2021) highlighted a successful vocational education model in a special needs school in Indonesia, stressing tailored programs, professional teachers, and practical exposure. Naveen (2022) focused on NEP 2020's vocational integration goals, targeting 50%

vocational exposure by 2025, emphasizing skill labs, industry partnerships, and societal attitude shifts.

Finally, Rao et al. (2024) examined the broader impact of vocational education on human development in India. They argued for integrating IT and entrepreneurial skills to bridge skill gaps, update curricula, and address societal biases. The study calls for major reforms to make vocational training a driver of economic growth, social inclusion, and national development. Zhou et al. (2024) highlights that both transfer generalization and maintenance are important aspects of learning transfer. The study found that teacher characteristics, programme design and the school environment are significant predictors of effective transfer generalization. Shubham Vats and Navita Malik (2024), reveal that integrating VET at the secondary level is essential for bridging skill gaps, promoting self-employment and aligning education with industry needs, but requires overcoming challenges like stigma, curriculum lag and unequal access through systemic reforms and strong public-private partnerships.

In conclusion, the collective body of research highlights that while vocational education holds immense potential for enhancing employability, bridging skill gaps, and supporting national development, its success is hindered by challenges such as outdated curricula, inadequate infrastructure, lack of trained teachers, poor industry linkages and societal biases. Hence, the current research titled, “An analysis of teachers’ perception towards vocational education and training in India” is undertaken to know the current status of vocational education training programmes in India.

Objectives of the study

- To understand the current scenarios of Vocational Education and Training (VET) in India.
- To identify the constraints in implementation of the VET in the states and UTs.
- To propose course of action to overcome the constraints in implementation of the VET in the States and UTs.

Research Methodology

Method: The study used a survey approach to collect data.

Research Tools: Structured Questionnaire was prepared and collected responses from vocational teachers from different schools of selected States and UTs of India. For analysis purpose frequency distributions, cross-tabulations, and inferential statistical were used to see pattern and correlations within the data by using SPSS Software. Stratified Random Sampling method is used for selecting the samples.

Sample Size: The study was conducted across 80 schools in seven states and three UTs (Daman & Diu, Dadra & Nagar Haveli, Gujarat, Haryana, Jammu & Kashmir, Meghalaya, Puducherry,

Sikkim, Telangana, Tripura, and West Bengal). Twoteachers from each school are part of sample size.

Secondary Data Sources: Secondary data were obtained from reports by government, central institutes, academic journals, and state & UT Department of School Education documents.

Limitations of the Study

The study's limitations include a limited focus of geographical location of seven states and three UTs in India. The conclusions are drawn on the basis of responses collected from the vocational teachers only.

Data Analysis and Interpretation

The analysis of the responses collected from the vocational teachers through structured questionnaire was done by using the SPSS software and different statistical tolls were used for the purpose of drawing inferences on the topic.

Attended any Training Programme in a Vocational Subject

Participation in vocational training programs represents a pivotal step towards acquiring specialized skills and advancing one's career prospects. Analyzing attendance data offers valuable insights into the efficacy and accessibility of these initiatives. By examining participation rates across States/UTs, it can identify trends and disparities in access to training opportunities.

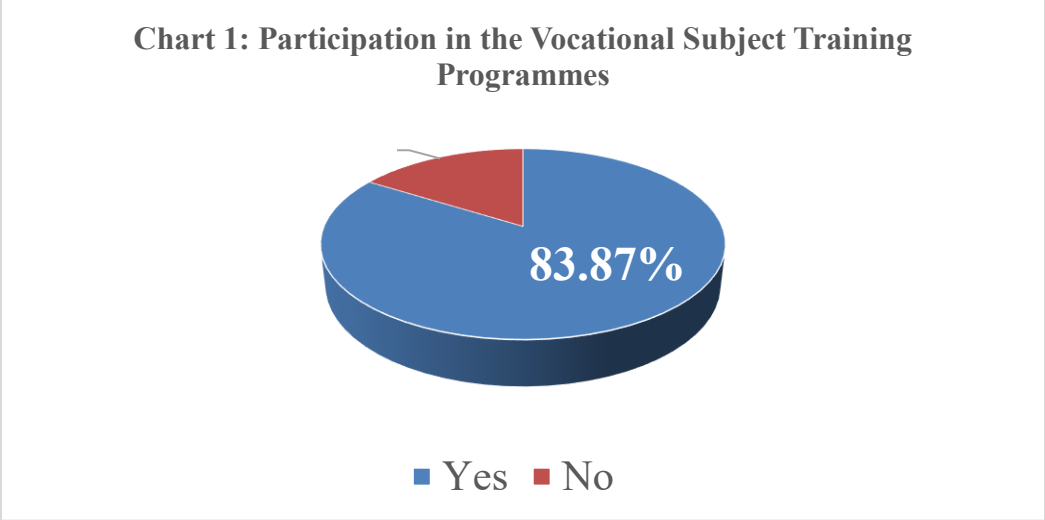


Table 1: Participation in the Vocational Subject Training Programmes

States/UTs	Yes	No	Total Response
J&K	12	4	16
Sikkim	11	3	14
Haryana	19	0	19
Tripura	13	1	14
West Bengal	14	1	15
Telangana	14	7	21
Puducherry	13	0	13
Gujarat	12	5	17
Daman & Diu and DNH	15	1	16
Meghalaya	7	3	10
Total	**130**	**25**	**155**
Percentage	**83.87%**	**16.13%**	**100%**

From the above Table 1 and Chart 1, it is inferred that the number of teachers who attended any training program in a vocational subject across various States/UTs and the majority of respondents in most States/UTs attended training programs, with the overall percentage of attendance being 83.87%.

Haryana were the highest number of respondents attending training programs (19 i.e. 100% of respondents), followed closely by Telangana (14 i.e. 67.67% of respondents). States like Meghalaya had lower participation, with only 7 respondents attending the Vocational Subject Training Programmes.

Table 2: Preference Given for a Participation in the Vocational Subject Training Programmes (Statistics)

Parameters	N	Mean	Mode	Preference	SD	Rank
Pedagogy	130	**1.29**	1	P1 – 100	0.56	**I**
Subject content	130	**2**	2	P2 – 80	0.623	**II**
Industry based	130	**2.71**	3	P3 – 98	0.532	**III**

The responses collected (Table 2) among those who attended training programs. Based on the mean scores, the parameters were ranked in terms of their perceived effectiveness. Pedagogy was ranked first, indicating its importance in delivering effective vocational training. Subject content was ranked second, suggesting its significance in providing relevant knowledge and skills. Industry-based training, although ranked third, had the highest mean score, highlighting its practical relevance and applicability. The standard deviation (SD) for each parameter indicates the spread or dispersion of responses around the mean.

The above Table 1 & 2 and Chart 1 suggests that, vocational training programs are generally well-attended (83.87%), with participants valuing effective pedagogy, relevant subject content, and industry-based training. This underscores the importance of designing comprehensive vocational training programs that cater to the diverse needs and preferences of participants while aligning with industry requirements.

Attended Induction Training Programmes organized for Vocational Teachers

For vocational teachers to effectively deliver vocational education, induction training programmes are essential in providing them with the skills and information they need. Analyzing data from induction training programs designed for vocational teachers provides crucial insights into professional development and instructional quality.

Table 3: Participation in Induction Programme

States/UTs	Yes	No	Total Response
J&K	14	2	16
Sikkim	14	0	14
Haryana	18	1	19
Tripura	13	1	14
West Bengal	12	3	15
Telangana	15	6	21
Puducherry	13	0	13
Gujarat	16	1	17
Daman & Diu and DNH	14	2	16
Meghalaya	5	5	10
Total	134	21	155
Percentage	**86.45%**	**13.55%**	**100%**

From the above Table 3 and data analysis on attendance at induction training programs organized for vocational teachers, it can be derived the following inferences:

- The response to the induction training programs varied across different States/UTs. The standard deviation for attendance indicates the spread or dispersion of responses around the mean.
- The majority of teachers (86.45%) across different States/UTs attended the induction training programs.
- Haryana had the highest attendance with 18 teachers out of 19, closely followed by Gujarat (16 out of 17) and Telangana (15 out of 21). States like Meghalaya had comparatively lower participation, with only 5 teachers attending out of 10. It means only 50% of the teachers were attending the induction programme from the Meghalaya.
- If we compare the percentage of attending the induction training programmes appears to be slightly higher (86.45%) compared to attendance at training programs for vocational

subjects (83.87%). This indicates a potential recognition of the importance of induction training specifically tailored for vocational teachers.

- In totality it denotes that, Induction training programs for vocational teachers are crucial for equipping them with the necessary skills and knowledge to effectively impart vocational education. Higher participation of teacher suggests a greater probability of teachers being equipped with the requisite tools to excel in their roles.

Vocational Teaching Materialsavailable with the School

The availability of vocational teaching materials, including curriculum/syllabus documents, textbooks, teacher guides, and e-learning materials, is fundamental to fostering effective instruction and student engagement in vocational education. Also, integral to delivering high-quality instruction and facilitating effective learning experiences for students. Therefore, to find out the availability of the teaching learning materials in the vocational school, the data were collected and analyzed as below:

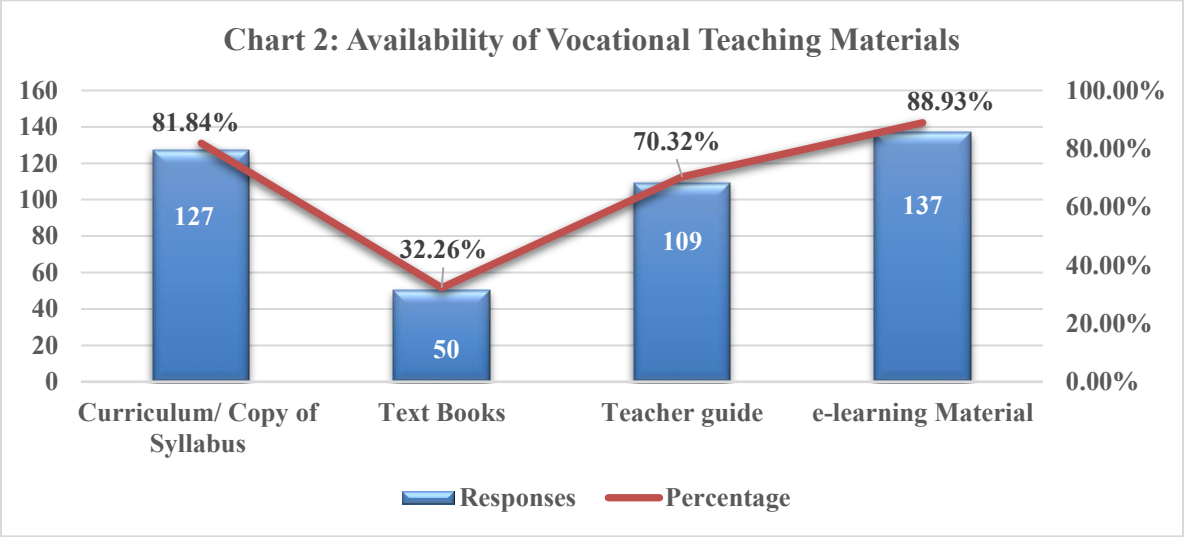


Table 4: Availability of Vocational Teaching Materials

States/UTs	Curriculum/ Copy of Syllabus		Text Books		Teacher guide		e-learning Material	
	Yes	No	Yes	No	Yes	No	Yes	No
J&K	15	1	4	12	8	8	14	2
Sikkim	13	1	14	0	7	4	10	4
Haryana	19	0	11	8	15	4	17	2
Tripura	12	2	8	6	13	1	14	0
West Bengal	13	2	5	10	10	5	13	2
Telangana	13	8	2	19	14	7	15	6
Puducherry	11	2	4	9	4	9	11	2
Gujarat	12	5	0	17	17	0	17	0
Daman & Diu and DNH	9	7	1	15	16	0	16	0
Meghalaya	10	0	1	9	5	5	10	0
Total	**127**	**28**	**50**	**105**	**109**	**43**	**137**	**18**
Percentage	**81.94%**	**18.06%**	**32.26%**	**67.74%**	**70.32%**	**27.74%**	**88.39%**	**11.61%**

From the Table 4 depicting the availability of vocational teaching materials within schools, it can derive several inferences:

- The response to the availability of teaching materials varies across different types, with some materials being more widely available than others. The standard deviation for each type of material indicates the spread or dispersion of availability across different States/UTs.
- Curriculum/Copy of Syllabus of teaching material is widely available across all States/UTs, with a high percentage of schools having it (81.94%).

- Textbooks are less available, with 32.26%, it means only 32 out of 100 vocational trainers opined that having vocational textbook with them.
- Teacher guides are widely available i.e. 70.32% with vocational schools.
- E-learning materials are the extensively available, with 88.39% of schools having them.
- Haryana and Telangana have the highest availability of almost all types of teaching materials, while Gujarat and Daman & Diu and DNH have comparatively lower availability. Sikkim, despite having a smaller number of schools, generally shows good availability of teaching materials.

Teaching Method Used in Classroom

Understanding the teaching methods employed in the classroom is vital for teachers to effectively engage students and promote learning. By comprehending diverse instructional approaches, teachers can tailor their methods to accommodate different learning styles and abilities, ensuring that all students have the opportunity to grasp concepts thoroughly. This knowledge also enables teachers to foster active participation, encourage critical thinking, and provide timely feedback, thereby creating a dynamic and supportive learning environment. Thus, following table is prepared to understand the teaching learning pedagogy and to know the most preferred method by the teachers in the vocational schools.

Table 5: Preferred Teaching Pedagogy

Statistics

Parameters	N	Mean	Mode	Preference	SD	Rank
Demonstration/Practical	155	1.11	1	P1 – 147	0.62	**I**
Power Point Presentation	155	2.639	2	P2 – 109	1.343	**II**
Video Presentation	155	3.316	3	P3 – 107	1.188	**III**
Role Play	155	4.103	4	P4 – 112	1.196	**IV**
Group Discussion	155	4.826	5	P5 – 118	0.968	**V**
Improved Lecture	155	5.839	6	P6 – 125	1.23	**VI**
Case Study	155	7.045	7	P7 – 131	0.668	**VII**
Project Method	155	7.69	8	P8 – 133	1.137	**VIII**
Problem Solving Method	155	8.503	9	P9 – 136	1.509	**IX**

The inference drawn from the above Table 5, regarding preferred teaching pedagogy is based on the statistical analysis of responses from 155 individuals. The key observations derived from the data analysis are as follows:

- Demonstration/Practical Method is a teaching method received the lowest mean score of 1.11, indicating that it is the most preferred method among the respondents. Additionally, it has the highest frequency (mode), with 147 out of 155 teachers selecting it as their preferred method. This suggests that there is a strong preference for hands-on, practical learning experiences in the classroom. On the other hand, Problem Solving Method, Project Method, and Case Study received higher mean scores, indicating lower preference among respondents.
- As the mean score increases, indicating lower preference, it observe a decreasing trend from Demonstration/Practical to Problem Solving Method. This implies that there is a general preference for more interactive and practical teaching methods over traditional lecture-based approaches. However, it's important to note that these methods still have some level of preference, albeit less than others.
- The analysis of preferred teaching pedagogy reveals a strong inclination towards hands-on, practical learning experiences exemplified by the Demonstration/Practical method. While this method emerges as the clear favourite, there exists a diverse range of preferences among respondents, suggesting the importance of incorporating various teaching approaches to cater to different learning styles and preferences.

Use ICT Tools in Teaching

Integrating Information and Communication Technology (ICT) tools in teaching offers numerous benefits for both teachers and students. By incorporating digital resources such as interactive whiteboards, educational apps, multimedia presentations, and online collaboration platforms, teachers can enhance the learning experience in various ways. ICT tools provide dynamic and engaging content, making complex concepts more accessible and stimulating students' interest and curiosity. The uses of ICT in different states /UTs are showcased as below:

Table 6: Use ICT tools in teaching

States/UTs	Yes	No	Total Response
J&K	15	1	16
Sikkim	11	3	14
Haryana	15	4	19
Tripura	12	2	14
West Bengal	11	4	15
Telangana	14	7	21
Puducherry	9	4	13
Gujarat	11	6	17
Daman & Diu and DNH	13	3	16
Meghalaya	6	4	10
Total	117	38	155
Percentage	**75.48%**	**24.52%**	**100%**

From the Table 6 of the use of ICT tools in teaching across different States/UTs, it can be inferred that:

- The majority of teachers (75.48%) across different regions reported the use of ICT tools in teaching.
- J&K had the highest percentage (93.75%) of teachers using ICT tools in teaching, with 15 out of 16 teachers affirming it. Meghalaya had the lowest percentage (60%)of teachers using ICT tools.
- The utilization of ICT tools in teaching can enhance the learning experience by providing interactive and engaging content, facilitating distance learning, and promoting digital literacy among students. Higher utilization (75.48%) suggest a greater probability of schools leveraging technology to improve teaching effectiveness and student outcomes.
- Despite the relatively high utilization rate, nearly a quarter (24.52%) of teachers reported not using ICT tools in teaching. This suggests potential challenges or barriers to

implementing technology in educational settings, which could include lack of infrastructure, resources, or training.

Rate your Pass-out Students on their Vocational Competency

Vocational teachers rigorously assess their pass-out students on their vocational competency, considering factors such as practical skills, theoretical knowledge, and industry relevance. Assessing students' vocational competency is crucial for several reasons such as valuable feedback, improvement in teaching methods and curriculum to better meet industry demands etc. Therefore, data were collected and tabulated in the following table from the vocational teachers to find out the vocational competency across different States/UTs.

Table 7: Ratings of Pass-out Students on their Vocational Competency

States/UTs	Excellent	Very Good	Good	Total Response
J&K	10	5	1	16
Sikkim	2	10	2	14
Haryana	11	8	0	19
Tripura	3	7	4	14
West Bengal	9	5	1	15
Telangana	15	6	0	21
Puducherry	5	8	0	13
Gujarat	4	8	5	17
Daman & Diu and DNH	10	6	0	16
Meghalaya	1	9	0	10
Total	**70**	**72**	**13**	**155**
Percentage	**45.16%**	**46.45%**	**8.39%**	**100%**

From the data provided in the Table 7 on the ratings of pass-out students by the vocational teachers on their vocational competency across different States/UTs, it can be said that,

- The majority of pass-out students across all States/UTs received ratings of either "Excellent" or "Very Good" in terms of vocational competency. The total percentage of

students rated as "Excellent" or "Very Good" is 91.61%. This suggests that vocational education programs are particularly effective in preparing students for the workforce.

- Haryana and Telangana has a high proportion of teachers rated as "Excellent" or "Very Good", indicating a strong vocational education system in the state. On the other hand, Meghalaya has the lowest proportion of teachers rated as "Excellent", suggesting potential areas for improvement in vocational education delivery.

Assessment of Vocational Students' Performance

Each assessment method serves a unique purpose in evaluating students' vocational competency, providing valuable insights into their knowledge, skills, and abilities. By incorporating a variety of assessment methods into vocational education programs, teacher can assess students' performance comprehensively and foster holistic development across cognitive, affective, and psychomotor domains.

Table 8: Assessment of Vocational Students' Performance

Parameters	N	Mean	Mode	SD	Rank
Classroom test	155	1.29	1	0.773	**I**
Project work	155	2.31	2	0.865	**II**
Assignment	155	2.852	3	0.763	**III**
Presentation	155	3.794	4	0.753	**IV**
Group discussion	155	4.768	5	0.643	**V**
End term exam	155	5.935	6	0.451	**VI**

By analysing the data of the above Table 8, it is inferred that,

- Classroom tests are ranked first in terms of mean score and mode, indicating that they are the most commonly used assessment method among vocational educators. This suggests that traditional written assessments conducted in a controlled classroom environment are widely utilized for evaluating students' understanding of theoretical concepts in vocational subjects.
- Project work and Assignments, Presentations, Group Discussions are ranked second, third, fourth and fifth respectively in terms of mean score. Whereas End-term exams are ranked sixth in terms of mean score and mode of 6, indicating that is least preferred by the vocational teachers for evaluating students' overall understanding of course material.

Result of Continuous Assessment for Improvement of Learning

Taking the ranking of continuous assessment results from vocational teachers is significant as it provides insights into individual student progress and overall class performance. Immediate feedback allows teachers to address learning gaps promptly, fostering a supportive environment for student growth. Moreover, facilitating student discussions encourages collaborative learning, enhancing critical thinking and communication skills essential for vocational success. Therefore, efforts were made to understand the vocational teachers' preference which leads to tailor instructional strategies to meet students' needs effectively, ultimately improving learning outcomes in vocational education.

Table 9: Ranking of the Result of Continuous Assessment for Improvement of Learning (Statistics)

Parameters	**N**	**Mean**	**Mode**	**SD**	**Rank**
By providing immediate feedback to each students	155	1.09	1	0.288	**I**
Allowing students to discuss among themselves	155	1.884	2	0.321	**II**

Table 10: State-wise Ranking of the Result of Continuous Assessment for Improvement of Learning

Preference No.	**Parameters**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**	**%**
1	By providing immediate feedback to each students	12	14	18	10	14	20	13	17	13	10	**141**	**90.97%**
2	Allowing students to discuss among themselves	4	0	1	4	1	1	0	0	3	0	**14**	**9.03%**
	Total	16	14	19	14	15	21	13	17	16	10	**155**	**100%**

Table 11: State and Code

Code	States/UTs
1	J&K
2	Sikkim
3	Haryana
4	Tripura
5	West Bengal
6	Telangana
7	Puducherry
8	Gujarat
9	Daman & Diu and DNH
10	Meghalaya

From the above Table 9 of Ranking of the result of continuous assessment for improvement of learning signifies that, providing immediate feedback to each student is ranked first in terms of mean score, indicating its significance in utilizing continuous assessment results for learning improvement. Immediate feedback allows students to receive timely guidance on their performance, identify areas for improvement, and make necessary adjustments to enhance their learning.

Whereas, Table 10 suggest that, the majority of respondents (90.97%) prefer providing immediate feedback to each student as a method for utilizing continuous assessment results for learning improvement. A smaller percentage of respondents (9.03%) prefer allowing students to discuss among themselves.

Evaluation Mechanism for Certifying the Vocational Students

Understanding the evaluation mechanisms used by vocational teachers for certifying students is crucial as it ensures that assessment methods align with the goals and nature of vocational education. The rankings advocate taking into consideration holistic methods of evaluation, which measure the students' skills, capabilities, and knowledge in a number of areas. Thus, the opinion of vocational teachers was undertaken to understand evaluation mechanism used by them to certify their vocational students and used mean statistics for raking the evaluation mechanism.

Table 12: The Evaluation Mechanisms used for Certifying Vocational Students (Statistics)

Parameters	N	Mean	Mode	Preference	SD	Rank
Written Examination	155	1.252	1	P1 – 132	0.651	**I**
Practical Examination	155	2.026	2	P2 – 127	0.509	**II**
portfolio Assessment	155	2.845	3	P3 – 127	0.56	**III**
Case Study	155	3.761	4	P4 – 137	0.722	**IV**

Based on the analysis of the above Table 12 of regarding the evaluation mechanisms used for certifying vocational students, following inferences can be drawn:

- Written examination is ranked first in terms of mean score (1.252), indicating its widespread use as an evaluation mechanism for certifying vocational students. This suggests that written examinations are commonly employed to assess students' theoretical knowledge and understanding of vocational subjects.
- Practical examination is ranked second in terms of mean score (2.026), highlighting its importance as an evaluation method for certifying vocational students. Practical examinations assess students' hands-on skills, application of theoretical knowledge, and ability to perform tasks relevant to their vocational field.
- Portfolio assessment and case study are ranked third and fourth, respectively, in terms of mean score (2.845 and 3.761), indicating their moderate use as evaluation mechanisms for certifying vocational students.
- The data reflects the adoption of diverse evaluation approaches, including both traditional methods like written examinations and more practical, application-based methods like practical examinations and case studies.
- The rankings suggest a consideration for holistic assessment approaches that evaluate students' knowledge, skills, and competencies across various dimensions.

Industrial Tour/Visit for Students

Taking students for industrial tours or visits is essential for providing real-world context to their vocational education. These experiences offer invaluable insights into industry practices, technologies, and workplace environments, bridging the gap between theory and practical application. Hence, it is better to understand the significance of encouraging and supporting industrial tours or visits as an essential element of vocational education by analysing data as below:

Table 13: Students Participation in Industrial Tour/Visit

States/UTs	Yes	No	Total Response
J&K	9	7	16
Sikkim	14	0	14
Haryana	19	0	19
Tripura	11	3	14
West Bengal	13	2	15
Telangana	18	3	21
Puducherry	4	9	13
Gujarat	15	2	17
Daman & Diu and DNH	12	4	16
Meghalaya	8	2	10
Total	123	32	155
Percentage	**79.35%**	**20.65%**	**100%**

From the above Table 13 on students' participation in industrial tours or visits across different States/UTs, it is observed that:

- A majority of students across the surveyed States/UTs have participated in industrial tours or visits, with 79.35% of respondents indicating “Yes”. This advocates a significant level of interest or encouragement for students to gain practical exposure and real-world insights into industrial processes and operations.
- States/UTs like Haryana, Sikkim, Gujarat, and Telangana have notably high participation rates, indicating a proactive approach towards facilitating industrial exposure for students. Conversely, States/UTs like Puducherry and Tripura show lower participation rates, suggesting potential areas for improvement in promoting industrial tours or visits.
- This also support the importance of promoting and facilitating industrial tours or visits as integral components of vocational education programs.

Nature of Involvement of Industry with the Schools

Analyzing data collected from vocational teachers regarding the nature of industry involvement with the school, including industrial field visits, guest lectures, and on-the-job training, holds immense significance. Considering this, the following table were prepared to find out the preference given for the vocational teacher for involving the industry in vocational education in their school.

Table 14: The Nature of Involvement of Industry with your School (Statistics)

Parameters	N	Mean	Mode	Preference	SD	Rank
Industrial field visit	155	1.208	1	P1 – 128	0.494	**I**
Guest lecture	155	1.955	2	P2 – 129	0.476	**II**
On the job training	155	2.818	3	P3 – 132	0.478	**III**

As per the Table 14 on the nature of involvement of industry with schools, it is observed that, Industrial field visits are ranked first in terms of mean score 1.208 and Mode - 1, indicating their significant prevalence as a form of industry involvement with schools. This suggests that many schools actively engage in organizing field visits to industrial sites, providing students with first-hand exposure to real-world industrial environments and operations. Also this support the result of Table 16: Students participation in Industrial tour/visit. Whereas, On-the-job training is ranked third, it indicating its relatively less preferred compared to industrial field visits and guest lectures.

Collaborative Arrangements for Practical Learning of Students

Understanding the opinion from vocational teachers regarding collaborative arrangements for practical learning of students is vital for teaching-learning process and tabulated in the following table. This helps to sense that the collaboration with industry and other experts will maximize practical learning experiences, enhancing students' vocational skills and overall educational outcomes.

Table 15: Any Collaborative Arrangements for Practical Learning of Students

States/UTs	Yes	No	Total Response
J&K	9	7	16
Sikkim	0	14	14
Haryana	12	7	19
Tripura	4	10	14
West Bengal	6	9	15
Telangana	20	1	21
Puducherry	5	8	13
Gujarat	7	10	17
Daman & Diu and DNH	13	3	16
Meghalaya	3	7	10
Total	79	76	155
Percentage	**50.97%**	**49.03%**	**100%**

From the above Table 15, it is clear that:

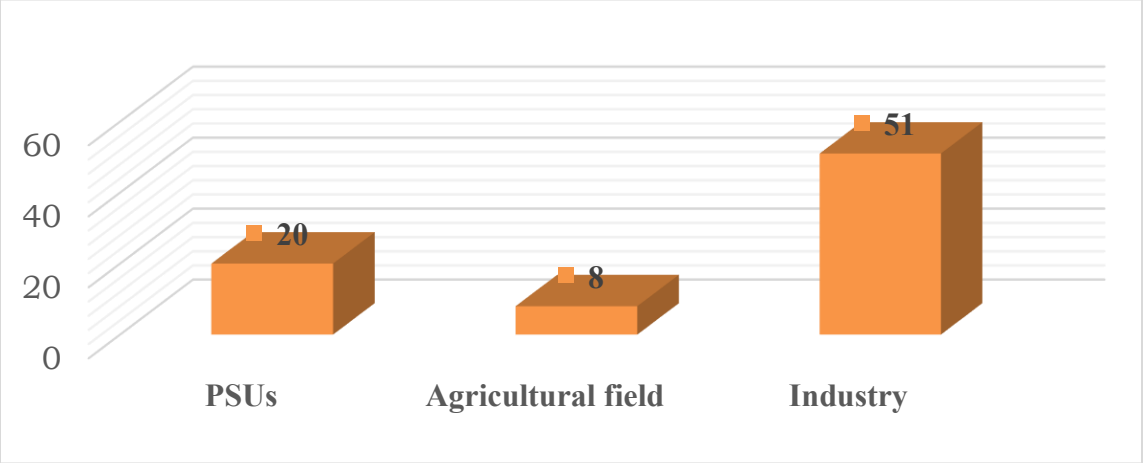
- 79 out of the 155 responses (50.97%) indicate the presence of collaborative arrangements for practical learning. This suggests that there is a moderate level of engagement in collaborative practical learning initiatives across the vocational schools.
- Telangana stands out as the region with the highest number of affirmative responses from the teacher, with 20 out of 21 responses indicating the presence of collaborative arrangements. This indicates a strong emphasis on practical learning initiatives in Telangana.
- Sikkim, on the other hand, has no affirmative responses, indicating a lack of collaborative arrangements for practical learning in the region because of less number of industries available in their state.
- Other regions like J&K, Haryana, and Gujarat also show relatively high numbers of affirmative responses, indicating varying levels of engagement across different states and union territories.

If yes, specify the areas:

Table 16: Collaborative Arrangement

Areas	Frequency	Valid Percent	Cumulative Percent
PSUs	20	25%	25
Agricultural field	8	10.2%	35.2
Industry	51	64.8%	100
Total	79	100%	

Chart 3: Collaborative Arrangement



From the above Table 16 and Chart 3, it can be further analysing from 79 responses for the collaborative arrangement for practical learning of the student in PSUs, Agricultural field and Industry as below;

- Among the areas specified for collaborative arrangements, the industry sector stands out significantly, with 64.8% of responses indicating engagement in this area. This suggests a strong emphasis on practical exposure to industrial environments for students across the surveyed regions.
- Public Sector Undertakings (PSUs) also hold a substantial share, with 25% of responses indicating collaborative arrangements in this sector.
- Agricultural fields, while comparatively lower, still show some level of engagement, with 10.2% of responses indicating collaborative arrangements.

Major Challenges in Implementing Vocational Education

Understanding the challenges of implementing vocational education is crucial for informed decision-making and vocational educational improvement. By identifying various obstacles, educators can develop targeted strategies to address these issues. Therefore, it is necessary to understand, from the point of view of the vocational teacher, what types of challenges they faced at the time of implementing vocational education. The below table was tabulated from the responses to understand the ranking of the challenges felt by vocational teachers.

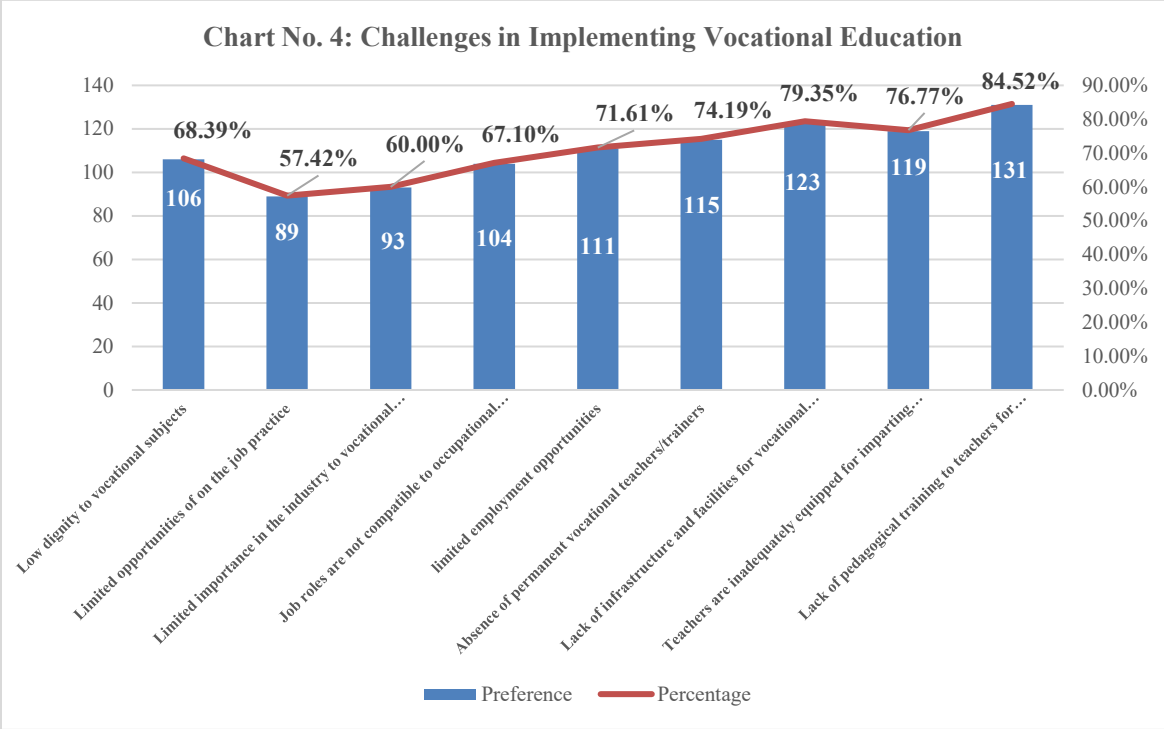


Table 17: Challenges in Implementing Vocational Education (Statistics)

Parameters	N	Mean	Mode	Preference	SD	Rank
Low dignity to vocational subjects	155	1.742	1	P1 – 106	1.418	**I**
Limited opportunities of on the job practice	155	2.652	2	P2 – 89	3.539	**II**
Limited importance in the industry to vocational course	155	3.735	3	P3 – 93	5.202	**III**
Job roles are not compatible to occupational structure of our country	155	4.387	4	P4 – 104	1.452	**IV**
limited employment opportunities	155	4.838	5	P5 – 111	1.063	**V**
Absence of permanent vocational teachers/trainers	155	5.71	6	P6 – 115	1.503	**VI**
Lack of infrastructure and facilities for vocational courses	155	6.581	7	P7 – 123	1.395	**VII**
Teachers are inadequately equipped for imparting vocational skills	155	7.548	8	P8 – 119	1.551	**VIII**
Lack of pedagogical training to teachers for vocational subjects	155	8.374	9	P9 – 131	1.856	**IX**

From the above Table 17 and Chart 4 on challenges in implementing vocational education, it can be inferred as:

- Challenges are ranked based on their mean scores, with lower mean scores indicating most preferred.
- Low dignity to vocational subjects is perceived to have the highest severity, with a mean score of 1.742 and a mode of 1. This indicates issues related to the perception and societal

values attached to vocational subjects are considered the most severe, indicating a need to address societal attitudes and perceptions towards vocational education.

- The ranking suggests that Practical training and exposure through on-the-job practice (Limited opportunities of on the job practice) are also identified as significant challenges, suggesting a need for increased industry collaboration and hands-on learning opportunities.
- Lack of alignment with industry needs and limited employment opportunities reflect concerns about the relevance and effectiveness of vocational education programs in preparing students for the workforce.
- Infrastructure and faculty-related challenges highlight the need for investment in resources and capacity-building initiatives to support vocational education institutions and teachers.
- Finally, it can be said that issues related to societal perceptions, lack of practical training opportunities, alignment with industry needs, and insufficient infrastructure and faculty resources are prominent. Addressing these challenges requires a multifaceted approach, including promoting awareness, strengthening industry collaboration, curriculum reform, and investment in infrastructure and teacher development.

Career Guidance and Counselling to Students at Schools

Providing career guidance and counselling to students is significant as it helps them explore their interests, identify career goals, and make informed decisions about their future. This support empowers students to navigate educational and professional pathways effectively, leading to greater satisfaction and success in their chosen careers. In this regards responses were collected from the vocational teachers to understand what type of activities or topics undertaken by them for providing career guidance and counselling to their students and tabulated in Table No.21 and Table No.18 as below:

Table 18: Career Guidance and Counselling to Students

States/UTs	Yes	No	Total Response
J&K	14	2	16
Sikkim	14	0	14
Haryana	19	0	19
Tripura	13	1	14
West Bengal	12	3	15
Telangana	20	1	21
Puducherry	11	2	13
Gujarat	17	0	17
Daman & Diu and DNH	15	1	16
Meghalaya	8	2	10
Total	143	12	155
Percentage	**92.26%**	**7.74%**	**100%**

From the data provided in above Table 18, it can be observed that:

- The majority of states/UTs surveyed provide career guidance and counselling to students, as indicated by the high percentage of "Yes" responses (92.26%).
- States like Sikkim, Haryana, Telangana, and Gujarat show a particularly high percentage of providing career guidance, with all respondents answering "Yes". On the other hand, Meghalaya has a lower percentage of "Yes" responses (80%) compared to the overall average.

If yes, what kind of guidance is provided?

Table 19: Career Guidance and Counselling Related Topics (Statistics)

Related topics	N	Mean	Mode	Preference	SD	Rank
Arranging specialized lectures in different sector skills	143	1.621	1	P1 – 115	1.344	**I**
Helping students in creating interest in the vocations	143	2.021	2	P2 – 109	0.661	**II**
Guiding students for future prospects in the area of vocational education	143	2.883	3	P3 – 111	0.712	**III**
Requesting industries of different skills sectors to present future prospects of skills	143	3.972	4	P4 – 115	0.687	**IV**
Helping students in preparing CV, attending group discussion and personal interview	143	4.772	5	P5 – 116	0.84	**V**
Guiding and coaching students for preparing for competitive exam	143	5.683	6	P6 – 127	0.948	**VI**

The data for above Table 19is collected from the teachers who responded that school provide the career guidance and counselling to their vocational students. The ranking based on mean values suggests the priority areas or the perceived importance of different types of guidance. After analysing the data, it is inferred that;

- A diverse range of career guidance services offered to students, covering various aspects of career preparation.
- Guidance related to vocational education and skills development is a significant focus, as indicated by the high mean values for guiding students on future prospects in vocational education and involving industries in presenting future prospects of skills.
- There's a notable emphasis on practical skills development, as seen in the provision of guidance related to job application preparation, attending group discussions, and personal interviews.

- Also indicate that, they are involving industries in presenting future prospects of skills suggests a practical approach to career guidance, aiming to align students' skills with industry demands.
- Coaching for competitive exams ranks lowest in perceived importance among the listed types of guidance. This may suggest that there is room for improvement in this aspect of career counselling, or it may indicate that students are already adequately prepared for such exams through other means

Recommendations

- It is necessary to create awareness in teachers/trainers of vocational subjects to attend Industry based training and conduct the Industry based training to prioritize incorporating real-world experiences, internships, and hands-on training opportunities into vocational programs to enhance students' readiness for the workforce.
- There is generally good availability of vocational teaching materials; there are still gaps, particularly in the availability of text books of the vocational subjects. Addressing these gaps and ensuring widespread access to all necessary teaching materials can significantly enhance the quality of vocational education and contribute to better outcomes for students.
- Vocational schools and teacher should remain adaptable in their teaching strategies cum pedagogies, ensuring individualized instruction and continuous improvement through regular assessment and feedback. By prioritizing engagement and flexibility in teaching methodologies, teacher can create dynamic learning environments conducive to enhanced learning outcomes and student success.
- Data suggest a significant proportion (75.48%) of teachers reported using ICT tools in teaching, there is still a notable percentage indicating otherwise. This highlights the need for further efforts to promote the effective integration of technology into educational practices, ensuring that all students have access to the benefits of digital learning tools and resources. Also those schools that have not yet adopted ICT tools may require additional support and training to effectively integrate technology into their teaching practices. Professional development programs for teacher/instructors can help build their capacity to leverage technology for enhanced learning experiences.
- It is suggested that, every vocational school should tie-up with nearby local industry for on-job training as well as experts from the industries for guest lectures, sharing their experiences which will help to inculcate and in enriching students' vocational educational experiences, fostering practical skills development, and preparing them for successful transitions into the workforce. Collaborative efforts between schools and industry stakeholders are essential for maximizing the benefits of such engagements and ensuring students' holistic development in vocational.

- It is recommended that, teacher need to be encouraged further for collaboration between vocational school and industries across all regions to provide more practical learning opportunities for students due to only 50.97% of the teacher are collaborating for practical learning to students. While industry collaborations are prominent, efforts should be made to diversify the areas of collaboration, including fields like agriculture, technology startups, research institutions, etc.
- To address the identified challenges in implementing vocational education, it's imperative to undertake several tactical initiatives.
    i. Comprehensive awareness campaigns are needed to enhance the societal perception of vocational subjects, emphasizing their importance in fostering practical skills and securing meaningful employment.
    ii. Partnerships with industries should be strengthened to provide ample on-the-job training opportunities, ensuring alignment with current job market demands.
    iii. Investments in infrastructure and facilities are crucial to create conducive learning environments for vocational students.
    iv. Additionally, professional development programs should be established to equip vocational teachers / instructors with the necessary skills and pedagogical training to effectively impart vocational skills.

Conclusion

At the end, above recommendations are based on the vocational teacher data for improving vocational education and enhancing the role of vocational teachers are significant for ensuring the effectiveness and relevance of vocational programmes. It is imperative to prioritize incorporating real-world experiences, internships, and hands-on training opportunities into vocational curricula, thereby enhancing students' readiness for the workforce. Addressing gaps in the availability of teaching materials, particularly vocational textbooks, and promoting adaptable teaching strategies and pedagogies can significantly enhance the quality of education and student outcomes.

Efforts should also be directed towards promoting the effective integration of technology into teaching practices, ensuring equitable access to digital learning tools and resources for all students. Collaboration between vocational schools and industries, including on-the-job training and guest lectures, is essential for enriching students' educational experiences and fostering practical skills development.

Furthermore, initiatives to increase collaboration between vocational schools and industries across all regions are necessary to provide more practical learning opportunities for students. Diversifying areas of collaboration beyond traditional industries can further enrich students' learning experiences.

Tactical initiatives, including awareness campaigns, strengthening industry partnerships, investing in infrastructure, and providing professional development opportunities for vocational teachers, are crucial for overcoming the challenges in implementing vocational education and ensuring its effectiveness. By implementing these recommendations, it can be foster a conducive environment for vocational education, preparing students for successful transitions into the workforce and contributing to overall economic growth and development.

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