Status of Practical classes of Polytechnic students in Barishal division: Focusing on Skills, Challenges & Way forward.

RESEARCH REPORT

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List of Acronyms

BTEB	Bangladesh Technical Education Board
DTE	Directorate of Technical Education
FGD	Focus Group Discussion
FGDI	FGD Issue
KII	Key Informative Interview
KIII	KII Issue
PBL	Project Based Learning
RQ	Research Question
SQ	Student Question
TQ	Teacher Question
TSR	Teacher Student Ratio
TVET	Technical and Vocational Education & Training

Abstract

The research conducted in Barishal Division's polytechnic institutions provides valuable insights into the state of technical education, highlighting strengths and areas for improvement. The study encompassed demographic analysis, attendance, completion rates, student activity, resource sufficiency, assessment practices, student-teacher ratios, interest in practical classes, skill development, syllabus alignment, infrastructure, and identified problems and recommendations for improvement. Key findings reveal commendable student attendance and interest in practical classes, indicating a positive attitude toward hands-on learning. However, challenges persist, notably in resource availability, teacher training, assessment practices, infrastructure, and student-teacher ratios. Disparities between private and public institutions underscore the need for targeted interventions to address shortcomings in resource allocation and educational practices. Recommendations include prioritizing teacher training, ensuring adequate resources, reviewing curriculum alignment with industry needs, improving student-teacher ratios, and fostering student engagement. Collaboration among stakeholders, including policymakers, institutions, and industry partners, is essential to implementing these recommendations effectively. By addressing these challenges and capitalizing on opportunities, polytechnic institutions in the Barishal Division can create a conducive learning environment that equips students with relevant skills for the job market. Such efforts are vital for promoting socio-economic development and fostering a skilled workforce.

Chapter One: Introduction

1.1 Background of Study

Technical and vocational education plays a pivotal role in equipping students with the necessary skills and competencies required for the workforce. Polytechnic institutions serve as key providers of such education, focusing on practical classes to develop students' hands-on skills. However, the status of practical classes in terms of skill development can vary significantly across different polytechnics. This research aims to investigate the status of practical classes for polytechnic students in the Barishal Division, specifically focusing on the development of skills, challenges, and ways forward.

The Barishal Division, located in the southern part of Bangladesh, has some public and private polytechnics. These institutions offer various technical programs, aiming to produce skilled professionals who can contribute to the local and national economy. However, limited research has been conducted to assess the current status of practical classes in these polytechnics, particularly in terms of their impact on skill development.

Understanding the status of practical classes and skill development is crucial for several reasons. Firstly, it enables an evaluation of the curriculum. It also provides insights into the availability and quality of resources, facilities, and equipment necessary for practical education. Additionally, exploring the challenges faced by polytechnics in delivering effective practical classes can inform the development of strategies and interventions to enhance skill development outcomes.

The research adopted a case study approach, investigating both private and public polytechnics in Barishal Division. This approach allows for an in-depth examination of the specific factors influencing the status of practical classes and the development of skills. Data was collected through a combination of qualitative and quantitative methods, including interviews, surveys, and document analysis. The study focused on gathering information

regarding the curriculum design, institutional practices, resources, assessment methods, infrastructure, and teachers-student perceptions related to practical classes.

The findings of this research contribute to the existing body of knowledge on technical and vocational education and provide valuable insights for policymakers, educational institutions, and stakeholders. The results can guide efforts to improve the quality and effectiveness of practical classes, ensuring not only polytechnic students in the Barishal Division but also a scenario of TVET of Bangladesh. Ultimately, this research aims to foster a more robust technical education system that supports economic growth and meets the demands of the job market.

1.2 Statement of the Problem

Despite the significance of practical classes in the polytechnics of Bangladesh, in the real practice of polytechnic institutes, practical classes have not been satisfactory as per the demand for skills. Therefore, already the skills of students decreased day by day. Public and private polytechnics are facing these problems. Here is limited research available on their status and effectiveness in skill development. This study aims to address this gap by examining the current state of practical classes in private and public polytechnics in the Barishal Division, identifying the challenges faced by instructors and students, and exploring potential solutions to enhance the quality and skills.

1.3 Importance of Study

The research titled "Status of Practical Classes of Polytechnic Students in Barishal Division: Focus on Skills, Challenges & Way Forward" holds significant importance as it addresses critical aspects of polytechnic education within the Barishal division.

By investigating the status of practical classes in the Barishal division, the study aims to uncover insights into skill development, challenges faced, and potential solutions. This research not only benefits the local polytechnic students in Barishal but also carries implications for TVET

nationwide. The findings can contribute to formulating a comprehensive national TVET strategy while also providing insights relevant to the broader Technical and Vocational Education and Training (TVET) system in Bangladesh.

In summary, the research on the status of practical classes for polytechnic students in the Barishal division serves as a valuable contribution to enhancing the quality and relevance of TVET in Bangladesh, with implications that extend beyond the local context to benefit the entire country.

1.4 Purpose and Research question of the study

The main purpose of this study is to assess the status of practical classes of polytechnic students in terms of skills, challenges & way forward. To achieve the stated purpose following specific research questions have been addressed:

i. What is the current status of practical classes at selected polytechnic institutes?
ii. What are the challenges faced in conducting practical classes at selected polytechnic institutes?
iii. How can these challenges be overcome?

1.5 Visible Impact on TVET

This research on the status of practical classes in polytechnics within the Barishal Division of Bangladesh holds significant implications for the improvement of Technical and Vocational Education and Training (TVET) in the country. By investigating the challenges and opportunities related to skill development in these institutions, research contributes to a deeper understanding of the factors influencing the effectiveness of TVET programs.

Through a comprehensive examination of curriculum design, institutional practices, resource availability, assessment methods, and infrastructure, the study sheds light on areas where improvements are needed. This insight is crucial for policymakers, educational institutions, and stakeholders, as it can inform strategic interventions aimed at enhancing the quality and relevance of TVET offerings.

Moreover, this research can potentially guide efforts towards fostering a more robust technical education system in Bangladesh. By addressing the identified challenges and implementing the recommended strategies, polytechnics can better equip students with the skills and competencies required to meet the job market demands. This, in turn, can contribute to economic growth and development by ensuring a steady supply of skilled professionals capable of driving innovation and productivity across various sectors.

1.6 Definition of Operational Terms

Technical and Vocational Education (TVET): Refers to educational programs that focus on providing individuals with practical skills, knowledge, and competencies required for specific trades, occupations, or professions. TVET encompasses a wide range of fields, including technology, engineering, healthcare, agriculture, and business.

Polytechnic Institutions: Institutions of higher education that offer specialized technical and vocational training programs, typically at the post-secondary level. Polytechnics emphasize practical, hands-on learning experiences to prepare students for careers in various technical and professional fields.

Practical Classes: Refers to instructional sessions within polytechnic education that emphasize hands-on learning, experimentation, and application of theoretical knowledge in real-world contexts. Practical classes often involve laboratory work, workshops, internships, and on-the-job training to develop technical skills and competencies.

Skill Development: The process of acquiring and improving specific abilities, expertise, or proficiencies that are relevant to a particular trade, profession, or task. In the context of TVET, skill development encompasses both technical skills (e.g., operating machinery, conducting experiments) and soft skills (e.g., communication, teamwork) necessary for success in the workplace.

Curriculum Design: Refers to the planning, development, and organization of educational programs, including course content, learning objectives, instructional methods, and assessment strategies. Effective curriculum design ensures alignment with industry standards, educational goals, and learner needs.

Institutional Practices: Encompasses the policies, procedures, teaching methodologies, and administrative processes adopted by polytechnic institutions to deliver educational programs and support student learning. Institutional practices influence the quality, relevance, and effectiveness of practical classes and skill development outcomes.

Assessment Methods: Refers to the techniques, tools, and processes used to evaluate student learning, performance, and attainment of learning outcomes in practical classes. Assessment methods may include written exams, practical demonstrations, project work, portfolios, and workplace assessments.

Infrastructure: The physical facilities, amenities, and support services available within polytechnic institutions to facilitate teaching, learning, and research activities. Infrastructure includes classrooms, laboratories, workshops, libraries, computer facilities, and student amenities.

Chapter Two: Literature Review

This chapter serves as the literature review, as a foundational exploration into the existing body of knowledge and research pertinent to polytechnic education within the Barishal Division. By synthesizing and analyzing a range of scholarly articles, reports, and publications, this section provides a comprehensive overview of the theoretical frameworks, methodologies, and findings relevant to the study's objectives. Through a systematic examination of literature spanning the importance of practical class, attendance patterns, resource allocation, curriculum development, and other critical dimensions, this review sets the stage for a deeper understanding of the contextual factors influencing polytechnic education in the region. By leveraging insights from previous research, this literature review informs subsequent discussions, conclusions, and recommendations, contributing to a more nuanced understanding of the challenges and opportunities within the polytechnic education landscape in Barishal.

2.1 Importance of practical class:

A practical is a 'hands-on' class that allows you to apply the theories you are learning in your course in practical situations (The Unversity of Queensland, 2015). For example, in an engineering course, practical classes may include conducting experiments or jobs in a laboratory. For Polytechnic Institute, Practical classes play a vital role in performance producing skilled Diploma engineers. In the Syllabus of BTEB, the design for theory class and the piratical class ratio is 40:60 (Board B. T., Regulation 2022, 2022). But in the present situation, Teachers in classrooms put less emphasis on practical, relevant tasks; rather, they spend a major portion of the class time delivering theoretical content (Haolader, 2015). It causes decreasing the skills of students. So, taking the initiative in the institute is necessary to ensure practical classes properly.

2.2 Infrastructure and Resources:

A few studies have examined the current status of practical education in polytechnic institutes across Bangladesh especially for the Barishal Division it's not to be discussed.

However, findings suggest that inadequate infrastructure, outdated equipment, and limited resources hinder the effectiveness of practical education (Harrell, 2018). Furthermore, the student's performance, contribution to socio-economic development, and ability to compete excellently in the technological world are hinged on infrastructural facility development (Fagbohunka, 2017). On the other hand, although in polytechnic institutions, a significant number of student enrollment increased, the number of infrastructure facilities has not increased accordingly (Hasan, 2022).

2.3 Teachers and Staff Training:

TVET teachers to become competent and play effective roles in training the hard skills, transmitting knowledge, and developing employability skills as preparation to develop skilled and competent graduates for future employment (Ali, 2015). (Kurnia, 2013) claims, that it is mandatory, for TVET-teacher; to include the relevant knowledge at workplaces, to include the teaching of the methodologies, to run research, and to be able to analyze workplaces or work processes. Meanwhile, (Sam, 2012) points out that TVET teachers need to have relevant training qualifications, be pedagogically competent, and have occupational skills.

2.4 Updated Curriculum:

According to the 10th Malaysian Plan 2011 to 2015 report, efforts have been made to implement and expand access to the quality of the Technical and Vocational Education and Training (TVET) educational sector to optimize the nationwide industrial needs (Omar, 2021). The curriculum should be revised and adopted according to the demand of the employers to generate more employment opportunities at home and abroad. (Abdullah-Al-Mamun, 2012). Furthermore, Teachers should establish linkage with their courses taught in relevant industries in fields of their students' future occupation and frequently gather practical skills requirements of the workplaces in the real world (Haolader, 2015). Create a meaningful career pathway for diploma students by incorporating a flexible demand-driven curriculum, upgrading the technical

and teaching skills of teachers as well as equipment and facilities, strengthening partnerships with industry to improve the quality of education and promote graduates' employment, expanding and improving job placement support services to students at the institution level (Shafiq, 2022).

2.5 Challenges for practical classes:

Challenges in Practical Education within Polytechnic Institutes Infrastructure deficiencies, including inadequate workshop facilities and outdated equipment, are prominent challenges (Bano, 2022). Students graduating from private polytechnics perform worse than public polytechnics and find that private polytechnics have a lower number of teachers and laboratory facilities (Forhad, 2022). Moreover, Institution capacity is one of the vital parameters that affect in production of competent graduates. From this study, it is clear that the number of instruments is not enough in the laboratory to conduct the test for all students at a time, which is an obstacle to producing competent graduates. Addressing the challenges faced in practical education requires a multifaceted approach. The teacher-to-student ratio is also a big challenge for practical classes. In National Education Policy 2010 (Ministry of Education, 2011), TSR is 1:12.

The literature reviewed underscores the importance of practical education in polytechnic institutes and highlights the challenges hindering its effectiveness in the Barishal Division. Addressing these challenges requires coordinated efforts from stakeholders to improve infrastructure, enhance faculty training, revise curricula, and strengthen industry-academia collaborations. By implementing these strategies, polytechnic institutes can enhance the status of practical classes and better prepare students for the demands of the workforce in the Barishal Division and all over the country.

2.6 Conceptual Framework

In this study, 1st find out the status of practical classes and then find out the challenges of practical classes and finally find out how to overcome them. Some indicators were selected for determining status, challenges, and overcoming the challenges.

For determination of status, Participation, Number of Classes, Number of jobs, Student Activities, Teacher activities, Availability of equipment & raw materials, Level of understanding, confidence of students, Assessment processes, Type of teacher requirement & experience of teachers were selected indicators.

For determination of challenges Infrastructure, Teachers' training related to Equipment, Student-space ratio for practical classroom, Student-equipment & raw materials ratio, Real-world equipment and raw materials, Numbers and duration of classes, Supply of Power, Relevancy of practical class activities with real-world practice were selected indicators.

For determination to overcome the challenges, Infrastructure, Teacher training, Student-space ratio, Ensuring equipment and raw materials. Updated equipment and raw materials, Practical class duration, Ensured sustainable power supply, and Updated curriculum.

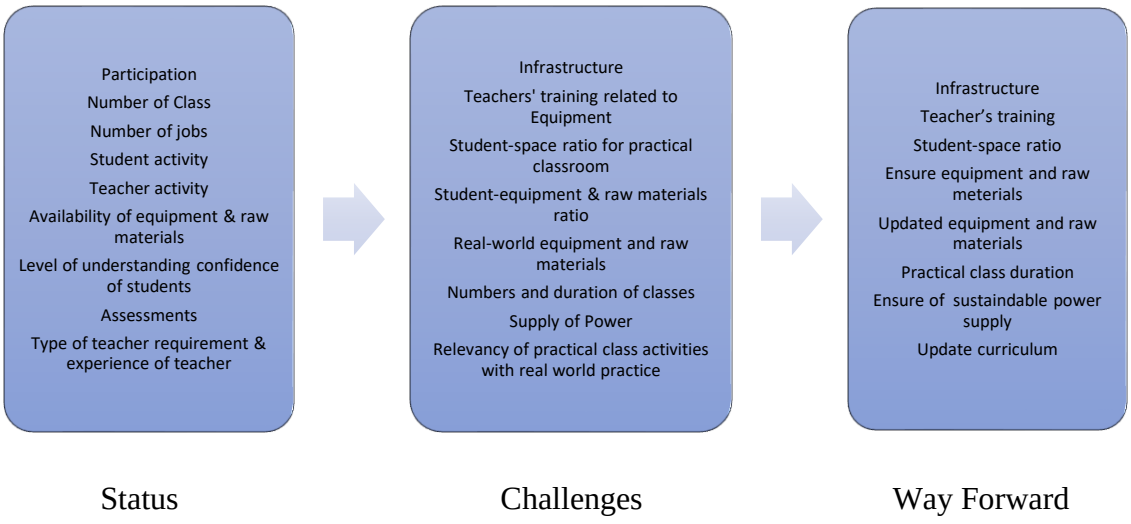

Figure 1: Conceptual Framework

Chapter Three: Methodology of the Study

This chapter discussed the design of the research, scope of the study, sample and sample size, sampling technique, data collection tools & how to use data collection tools, data analysis technique, ethical considerations, and limitations of the study.

3.1 Research Design

This study adopts a mixed-methods research design to investigate the status of practical classes for polytechnic students in the Barishal Division, with a specific focus on skill development, challenges, and the way forward. The research design encompasses both qualitative and quantitative approaches simultaneously to provide a comprehensive understanding of the factors influencing the effectiveness of practical education in polytechnic institutions. Therefore, the convergent parallel mixed-method research design has been employed for this study.

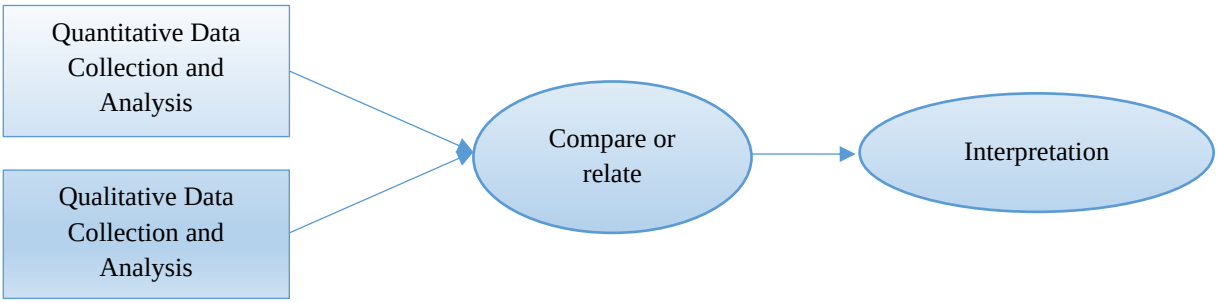

Figure 2: Convergent parallel mixed-method design.

3.2 Scope of the Study

This study delves into examining the status of practical classes for polytechnic students within the Barishal Division of Bangladesh. It encompasses various facets related to practical education, skill development, challenges, and potential improvement strategies. The study is geographically confined to the Barishal Division, situated in the southern region of Bangladesh. Both public and private polytechnic institutions within the Barishal Division are subject to examination. Key participants include the principal of the institute, the Head of the departments,

Teachers, and students from selected polytechnic institutions. The study centers on exploring the status of practical classes concerning curriculum design, institutional practices, resource availability, assessment methods, infrastructure, and teachers-student perceptions. It particularly emphasizes skill development among polytechnic students and the challenges confronted by institutions in delivering effective practical education.

3.3 Sample and Sampling Size

In this study 7710 students, 209 teachers, and 8 Principals of the Institute having 8 polytechnic institutes. 1067 students and 70 teachers from four private polytechnics, and 6643 students and 139 teachers from four public polytechnics of Barishal Division. By standard sample size formula (www.cuemath.com, n.d.), Sample Size n = N * [Z2 * p * (1-p)/e2] / [N – 1 + (Z2 * p * (1-p)/e2], where N = Population size, Z = Critical value of the normal distribution at the required confidence level, p = Sample proportion, e = Margin of error, Consider a 5% error, 95% confidence level, the sample size of students is 366, and consider a 10% error, 95% confidence level sample size of Teachers is 67. 49 heads of the departments were selected for FGD and all principals of the 8 institutes were selected for KII for qualitative data. The quantitative and qualitative sample is shown in Table 1.

Table 1: Quantitative and Qualitative sample of the study

Data Source	Data Type	Private Polytechnic	Public Polytechnic	Total population	Sample Size
Student	Quantitative	1067	6643	7710	366
Teacher	Quantitative	70	139	209	67
Head of the Department	Qualitative	20	29	49	49
Principal	Qualitative	4	4	8	8

3.4 Sampling Techniques

Sampling technique for students: Random sampling techniques were employed to select participants from the students. Random sampling ensures that every student has an equal chance of being included in the survey.

Sampling technique for teachers: Teachers were divided into two categories, Heads of the Departments and general teachers. Data collection from general teachers also used random sampling to ensure every teacher has an equal chance of being included in the survey. All Heads of the departments were involved with FGD for qualitative data.

Sampling technique for principals: Principals of the institutes were selected for KII for qualitative data.

Sampling technique for qualitative data: Data was collected from the head of the department by FGD and the principal of the institute by KII. Only 8 polytechnics were selected for this study so all of the principals of the institute and the head of the department were included as samples for qualitative data for better analysis.

Sampling technique of documents: Documents collected from BTEB, DTE, and Institute as per needs.

Table 2. Details of the number of collected data

Data Source	Data Collection Tool	Data for Analysis
Students	Questionnaire Hard Copy	366
Teacher	Questionnaire Hard Copy	67
Head of the Department	FGD	10
Principal of the Institute	KII	8
BTEB, DTE, Institute	Documents (Number of Students, Number of teachers, Number of practical classes, Infrastructure, Equipment, Raw materials, etc.)	As per needs

3.5 Data Collection Tools

The following tools have been used for data collection:

- **Questionnaire:**

This study has two questionnaires for teachers and students. Each questionnaire includes close-ended questions, and each variable was assessed using a 5-point Likert scale. The questionnaire is used for student data collection having some demographic data related

questions, practical status, challenges, and way forward related questions. Maximum questions answer data are quantitative. A few are explanatory, and that is also related to quantitative data. The questionnaire for teachers is almost the same just a few more explanatory data were included.

- **FGD guide:**

FGD guidelines were helped with data collection from the Head of the department by FGD. Guideline having some issues. These are Information on teachers, Information about practical class, Information on equipment and raw materials, challenges, and the way forward of practical class (Appendix C1)

- **KII guide:**

KII guidelines were helped with data collection from the principals of the institutes. This guideline also has some issues. These are Information about the institute, Information on teachers, Information on practical class, Information on equipment and raw materials, challenges, and the way forward of practical class (Appendix B1)

- **Documents:**

Documents are related to information about the institute, Information about the teacher, Information on equipment and raw materials, Information on infrastructure, Rules and regulations of the Diploma in engineering, etc.

3.6 Use of Data Collection Tools

The student survey was used for 8 selected polytechnics by student questionnaire. 366 data were collected by questionnaire. All data were tried to collect uniformly with department and number of students. Teacher surveys are also used in the same way as teacher questionnaire data collected from the Head of the department by FGD. FGD was followed by FGD guidelines. Data collected from the principal of the institute by KII were followed by KII guidelines.

3.7 Data Analysis Techniques

The data analysis techniques employed in this study were guided by the research questions, the nature of the data collected, and the overall research objectives. Given the mixed-methods approach adopted in the study, a combination of qualitative and quantitative data analysis techniques was utilized shown in Figure 23. Here are the proposed data analysis techniques:

3.7.1 Qualitative Data Analysis

a. **Thematic Analysis:** Qualitative data obtained from semi-structured interviews, FGD, and document analysis were subjected to thematic analysis. This involves systematically identifying, analyzing, and interpreting patterns or themes within the data. The analysis involved coding the data, grouping codes into themes, and interpreting the underlying meanings and implications of these themes.

b. **Content Analysis:** Document analysis involves a content analysis approach, where textual data from curriculum documents, institutional policies, and relevant reports are systematically analyzed to identify recurring themes, patterns, and trends. This approach helped in understanding the content and context of practical education in polytechnic institutions.

3.7.2 Quantitative Data Analysis

Descriptive Statistics: Quantitative data was collected through surveys and was analyzed with descriptive statistics such as frequencies, percentages, means, compare means, crosstabs, and multiple response frequency analysis. Descriptive statistics were used to summarize and present the characteristics of the sample population, as well as key variables related to resource availability, student perceptions, and skill development outcomes.

SPSS and Excel are used for qualitative and quantitative data analysis. These tools offer functionalities for data organization, coding, visualization, and statistical analysis, facilitating efficient and systematic data analysis processes.

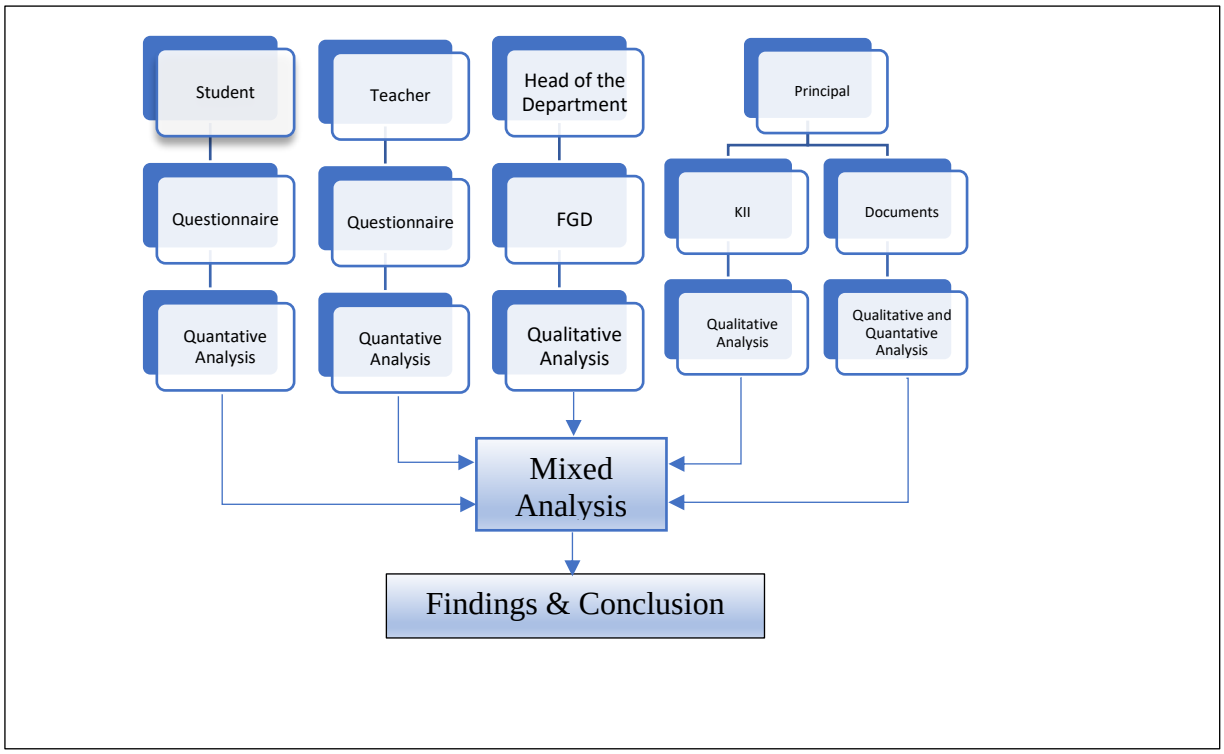

Figure 3: Data Analysis Technique

3.8 Ethical Considerations

1. **Informed Consent**: Ensure that participants, including students, instructors, and administrators, are fully informed about the purpose, procedures, and potential risks and benefits of participating in the research.
2. **Confidentiality**: Safeguard the confidentiality of participants by anonymizing data and ensuring that any information shared in the research remains confidential, especially when discussing sensitive issues or personal experiences.
3. **Voluntary Participation**: Guarantee that participation in the research is voluntary and that participants have the freedom to withdraw at any time without facing any negative consequences.
4. **Respect for Autonomy**: Respect the autonomy of participants by allowing them to make informed decisions about their involvement in the research and by seeking their input on any decisions that may affect them.

5. **Avoidance of Harm**: Take measures to minimize the potential harm or discomfort that participants may experience as a result of their participation in the research, particularly when discussing challenges they may face in practical classes.
6. **Conflict of Interest**: Disclose any potential conflicts of interest, such as personal biases or affiliations with certain institutions, that could influence the research findings or interpretation of results.
7. **Respect for Diversity**: Acknowledge and respect the diverse perspectives, experiences, and backgrounds of participants, ensuring that the research is inclusive and representative of the polytechnic population.
8. **Transparency**: Maintain transparency throughout the research process by clearly documenting methodology, data collection procedures, and any limitations or biases that may affect the interpretation of results.
9. **Responsible Reporting**: Present the research findings accurately and objectively, avoiding sensationalism or exaggeration, and acknowledging any limitations or uncertainties in the data.

3.9 Limitation of Study

The research is limited to the Barisal Division of Bangladesh due to logistical constraints and resource availability. Conducting research solely within this geographic area allows for an in-depth investigation into the status of practical classes in polytechnics within this specific region. However, this limitation may restrict the generalizability of findings to other divisions or regions within Bangladesh, as educational practices and challenges may vary across different geographic areas. Additionally, focusing solely on the Barisal Division may overlook valuable insights that could be gained from comparing and contrasting with other regions. Therefore, while the findings of this research provide valuable insights into the challenges and opportunities specific to the Barisal Division, caution should be exercised when extrapolating these findings

to broader contexts. Another limitation is the time-binding of the study. This study examined just a semester, but if it is possible to observe two-semester activities of practical classes then a clearer picture may be obtained.

Chapter Four: Results and Interpretation

This chapter discusses about major findings of the study and the interpretation of these results. To meet the answers to research questions, results have been interpreted using tables and figures where necessary.

4.1 Current Status of Practical Classes

In this study select 4 private and 4 public polytechnics of Barishal Division. At the time of study students of the 8th semester were in Industrial attachment so 2nd, 4th, and 6th semester students were the population of the study. 7710 students and 209 teachers were the population for the survey (Appendix D.1 & D2). FGD was taken from 49 Heads of the Departments and KII was taken from 8 Principals of the Institute (Table 2). For the students survey sample size is 366 and for the teachers survey it's 67 (Table 1). 366 students' data were approximately distributed Institute and technology basis (Appendix D1 & D3). For easier analysis, Computer Science and Technology and Computer technology were treated as the same technology (Appendix D3). For the status of the practical class some indicators were selected (Appendix D5). These indicators are used for data analysis of Research Questions.

4.1.1 Attendance

Average number of practical classes in a week was 6 (Appendix D4). Data of frequency analysis shown in Table 3 that Only 6.9% (1.4%+5.5%) of students attend below 33% of the class. The mean of held class is 5.08 and the mean of students attending class is 4.58. Percentage of attendance (4.58/5.08) X 100 = 90% which is a satisfactory level of attendance.

Table 3. Number of practical classes held and student's attendance in practical class in a week

Number of practical classes held in a week	Percent	Student attend class in a week	Percent	Number of Average Practical classes, Mean of Held, and Mean of Attend.
1	0	1	1.4	Number of Average classes=6 Mean of class held=5.08 Mean of attending in class=4.58 Percentage of Attendance = 90%
2	.8	2	5.5	
3	9.3	3	14.5	
4	22.4	4	23.0	
5	33.9	5	31.7	
6	18.9	6	18.0	
7	11.2	7	3.8	
8	3.6	8	2.2	

4.1.2 Completed Job in a Semester

According to BTEB, the 16th week semester there in the 5th and 13th weeks is for class tests and the 8th week is for mid-semester examinations. However, for mid-semester design for one week in 5 days of class time, it needs two weeks. If the last week is used for revision, then actually 11th week is for class time. Sometimes performing a complete job needs more than 1 class. If 2 classes are needed for 1 complete job, then in a semester it's possible to complete (11X6)/2=33 job. From the findings of the analysis, the mean private polytechnic has a little poor performance of completing the job (17.79) in a semester where public polytechnic is better (22.82).

4.1.3 Student Activity during Practical Classes

The findings of the study are most 83% of students are active in practical classes and the teacher just helps a little bit. Only 2.7% are not active in practical classes. they are shown in Figure 4.

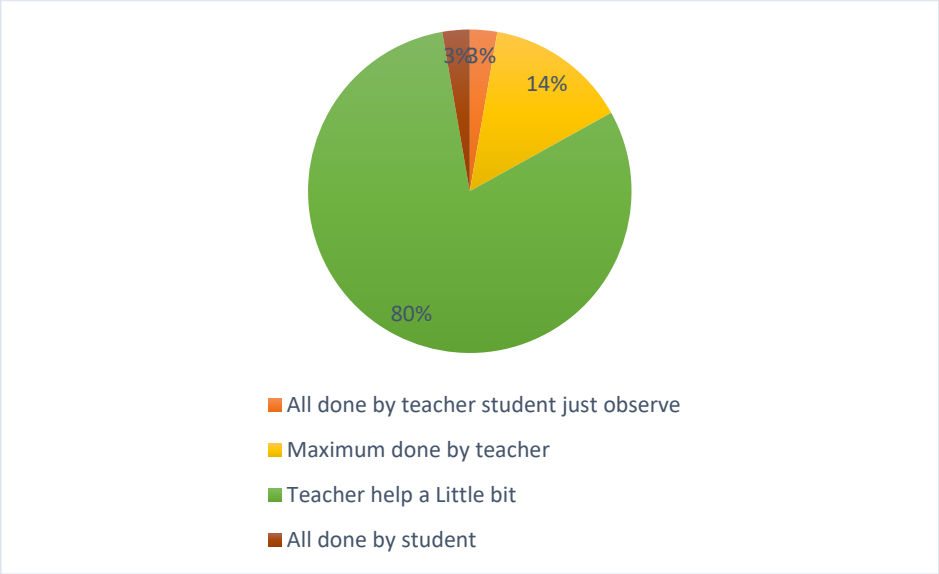

Figure 4: Student Activity in Practical Class

4.1.4 Sufficiency of Equipment and Raw Materials

Data analysis from student data shows that only 11.2% of students thought they had the most sufficient equipment in their labs/workshops whereas 4.6% students reported of having below 20% of equipment. In addition, 10.4% students reported of having only 20%-39% of

equipment, 27% reported 40%-59%, and 46.7% reported having 60%-79% of equipment in their workshops. Similarly, only 6% of teachers reported that they have sufficient equipment in their workshops while another 6% teachers reported of having below 20% equipment considering their requirements. In addition, only 1.5% of teachers reported having 20%-39% of equipment while 37.3% of teachers reported 40%-59%, and around half (49.3%) reported having 60%-79% in their workshops [Table 4].

Analysis of Equipment sufficiency with a related subject, findings from student data show that the all-sufficiency of equipment is 6.3% where none is 0%, a few is 4.6%, moderately is 45.1%, most is 44%, and teacher data, all-sufficiency of equipment is 0% where none is also 0%, a few are 7.5%, moderately is 41.8.%, and most are 50.7% shown in Table 5.

Table 4: Sufficiency of Equipment and Raw Materials

Student Response			Teacher Response		
Sufficiency of Equipment	Frequency	Percent	Sufficiency of Equipment	Frequency	Percent
Below 20%	17	4.6	Below 20%	4	6
20%-39%	38	10.4	20%-39%	1	1.5
40%-59%	99	27	40%-59%	25	37.3
60%-79%	171	46.7	60%-79%	33	49.3
80%-100%	41	11.2	80%-100%	4	6.0

Table 5: Sufficiency of Equipment and Raw materials related to the subject

Student Response			Teacher Response		
None	0	0	None	0	0
A few	17	4.6	A few	5	7.5
Moderately	165	45.1	Moderately	28	41.8
Most	161	44	Most	34	50.7
All	23	6.3	All	0	0

It is observed that findings from student data and teacher data were very similar but compared the mean of private institutes and public institutes had different findings. Public institutes have more availability of equipment and raw materials. The mean availability of equipment in public institutes is 3.60 and in private institutes, it is 2.85. The mean availability of raw materials in public institutes is 3.62 and in private institutes, it is 2.98 shown in Table 6.

Table 6: Compare the mean of the sufficiency of Equipment and Raw materials

Sufficiency of Equipment	Mean	Sufficiency of raw materials	Mean
Private	2.85	Private	2.98
Public	3.60	Public	3.62

4.1.5 Level of Understanding

For the level of understanding from student data, only 1.4% of students have a below 20% level of understanding whereas 4.4% of students reported that they have a 20%-39% level of understanding. In addition, 14.2% of students reported a 40%-59% level of understanding, 36.1% of students reported a 60%-79% level of understanding, and a significant 44% students reported, that they had an 80%-100% level of understanding. From teacher data, 0% of teachers responded that students have a 20% level of understanding only 1.5% of teachers reported that 20%-39% of students have a level of understanding whereas 31.3% of teachers reported that students have an 80%-100% level of understanding where 25.4% of teachers reported that students have a 40%-59% level of understanding 41.8% reported students understanding level is 60%-79% shown in Table 7. If over 60% of understanding is a satisfactory level, 80.1% (36.1%+44%) students were at a satisfactory level from student data and 73.1% (41.8%+31.3%) students were at a satisfactory level from teacher data.

Table 7: Understanding the level of students

Student Data		Teacher Data	
Below 20%	1.4	Below 20%	0
20%-39%	4.4	20%-39%	1.5
40%-59%	14.2	40%-59%	25.4
60%-79%	36.1	60%-79%	41.8
80%-100%	44	80%-100%	31.3

4.1.6 Self-doing Capability

After completing a job in the practical class student should perform that job by himself/herself. Analysis of the Self-doing capability of students in Figure 5 shows that maximum students were 60%-79% capable of self-doing, and very little percent were in the level

below 20%, understanding level of 40%-59% also notable in the chart and 80%-100% were roughly percentage at in chart.

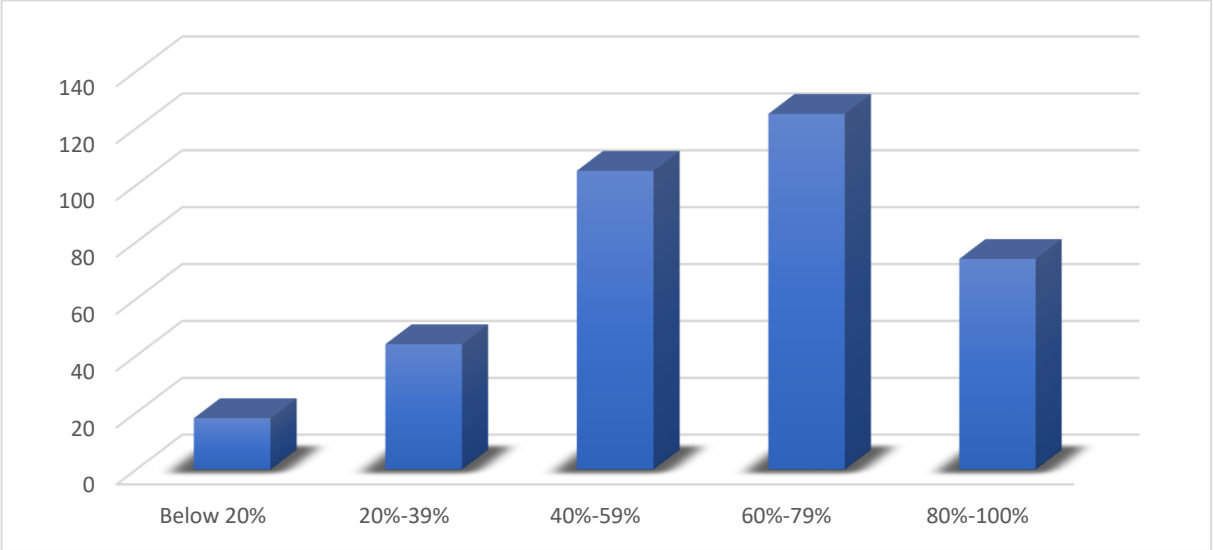

Figure 5: Self-doing Capability of a Student

4.1.7 Assessment in Practical Classes

The process of practical class assessment is pre-determined by the regulation provided by BTEB. Assessment is done by practical continues and practical final evaluation. For practical continues is 50% and practical final contained 50% of the mark. Distribution of this mark is Job/Experiment (25%), Homework (05%), Report of Job/Experiment (05%), Oral Exam on Job/Experiment (05%), Behavior (02%), Attendance (08%). Attendance marks depend on attendance, 8% mark is for above 90% of attendance and a 6-7% mark is for 80-89% of attendance shown in Table 8. Practical final mark distribution is Job/Experiment (30%), Report of Job/Experiment (10%), Oral Exam on Job/Experiment (10%) shown in Table 9.

Table 8: Provision of continuous assessment of practical class in regulation provided by BTEB

Assessment of practical continuous	
Field of Assessments	Distribution of 50%
a. Job/Experiment	25%
b. Homework	05%
c. Report of Job/Experiment	05%
d. Oral Exam on Job/Experiment	05%
e. Behavior	02%
f. Attendance	08%
8% is for above 90% of attendance and 6-7% is for 80-89% of attendance	

Table 9: Provision of final assessment in practical regulation provided by BTEB

Assessment of practical final examination	
Field of Assessments	Distribution of 50%
a. Job/Experiment	30%
b. Report of Job/Experiment	10%
c. Oral Exam on Job/Experiment	10%

Finding of research from 67 data from the teachers, all of them not follow all of the criteria of the assessment process given by BTEB, and no one focuses on the behavior of students. which is shown in Table 10.

Table 10: Assessment process by teacher

Assessment Process	Number of responses	Percent of response
Asking Question	41	61.2%
Observe Practical class	65	97.0%
Attendance	35	52.2%
Job Report	42	62.7%

4.1.8 Teacher-Student Ratio

The status of the number of teachers is very poor. In National Education Policy 2010 (Ministry of Education, 2011), TSR is 1:12. Focused 7710 students of Barishal Division need teachers as TSR is 643 but the present status of teachers is 209 which is only 32.5% of the required teachers.

4.1.9 Interest in Practical Class

Findings of students' learning interest, 70.8% of students have an interest level of 80%-100%, 22.4% of students have an interest level of 60%-79% and, very few students 6.8% (5.7%+1.1%) have below 60% of interest. It is shown in Figure 6.

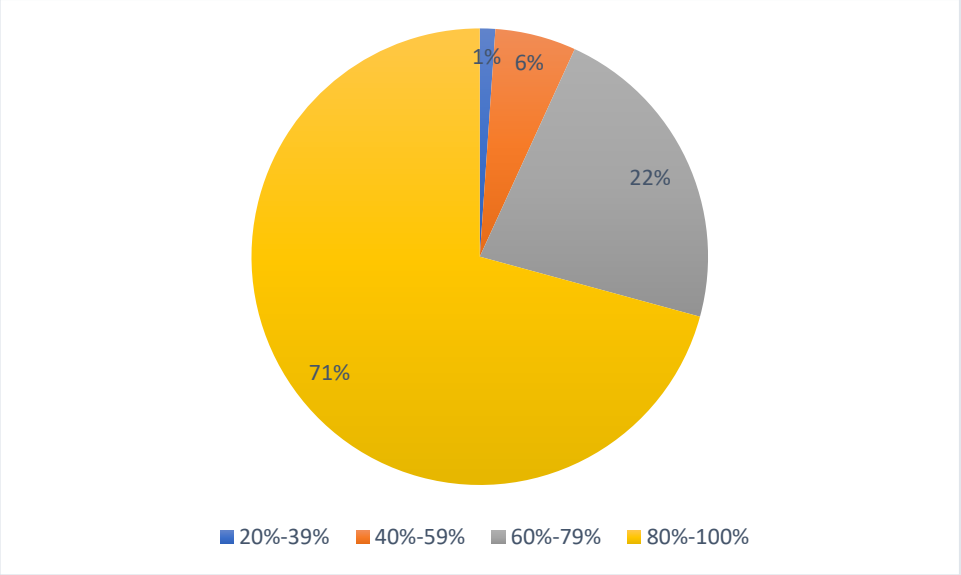

Figure 6: Interest in Learning

4.1.10 Development of Skills

Data analysis for the development of skills of students that the level 80-100% skills are less than 1% and 60-79% skills 19.7 % most (73.2%) having skills level 40-59%. They are shown in Figure 7. So, the finding of data indicates that mid-level skills were student achieved.

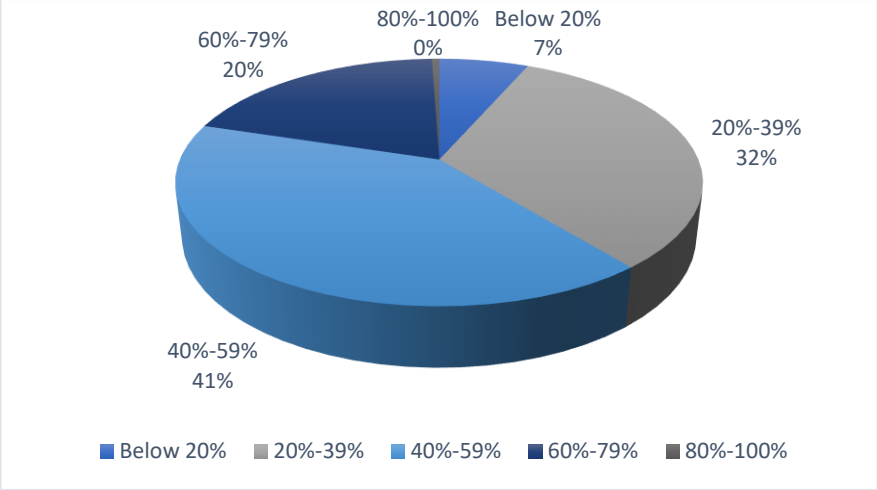

Figure 7: Development of Skills

4.1.11 Innovative Idea Generation

In the Innovative Idea Generation, maximum students have a level of 20%-59%, below 20% were notable and 40%-59% were roughly of percentage at in chart. shown in Figure 8.

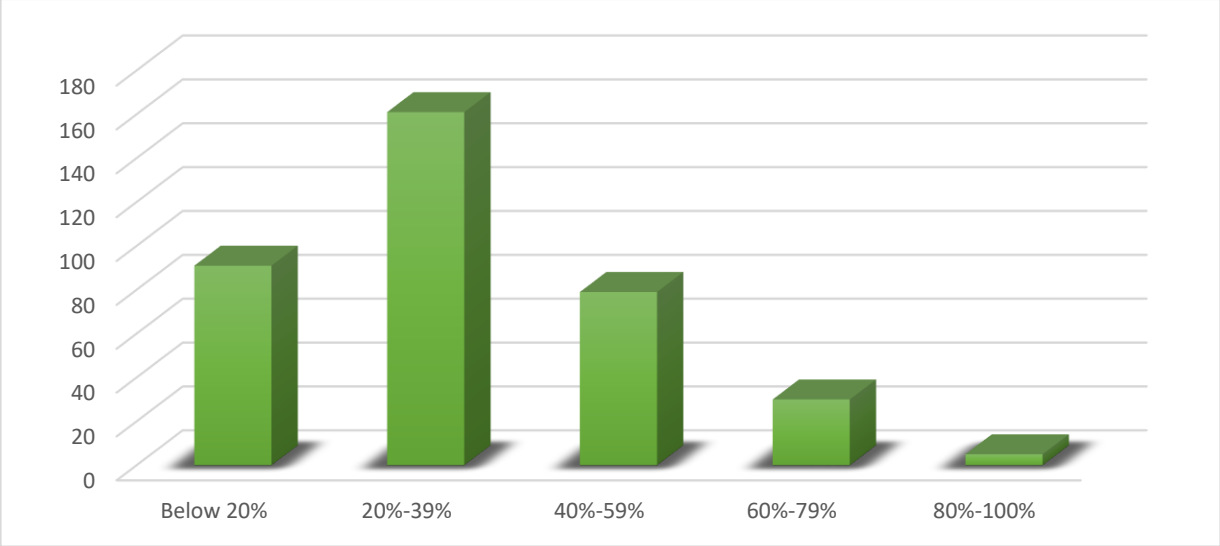

Figure 8: Innovative Idea Generation

4.1.12 The Similarity of the Syllabus with the Market Demand

From data analysis using compare means, most students agree that the syllabus is similar to the market demand but see that it's very with technology by comparing means with technology. Civil (4.56), Power (4.35), and Mechanical (4.28) technology is very similar to the market demand whereas Electronics (3.37), Automobile (3.50), and Marine (3.50) technology is less similar to the market demand. Shown in Figure 9.

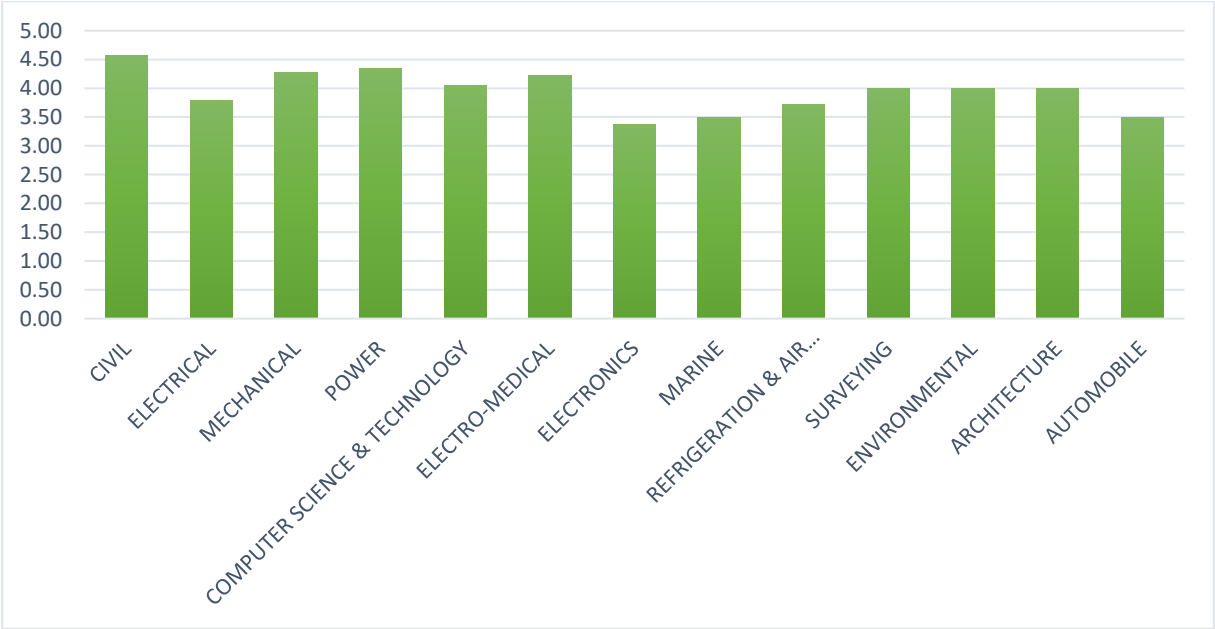

Figure 9: similarity of the Syllabus with the Market Demand

4.2 Challenges Faced in Conducting Practical Classes

Findings from data using multiple response frequency analysis, a lot of responses from students and teachers that they faced challenges in practical class. Analyzing all challenges find that most of the challenges are major but a few can be neglected due to their percentage of the response.

4.2.1 Teachers are not trained in equipment or conducting practical class

It is a major challenge because a significant (82%) of students and most teachers (97%) say that they faced challenges because teachers had lack of equipment training or did not have training for conducting practical classes. Shown in Figure 10. Qualitative data also express that both Heads of the departments and Principals of the institute highlighted the lack of adequate training in equipment handling and practical skills. Qualitative data emerges prominently, with a significant percentage of respondents indicating that teachers are not adequately trained.

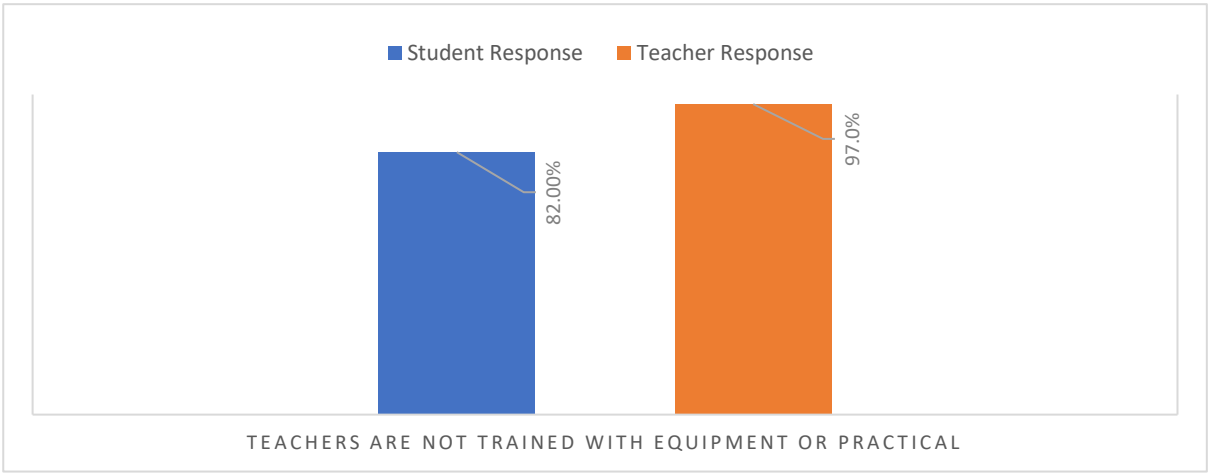

Figure 10: *Challenges Faced in Conducting Practical Class (Training)*

4.2.2 Challenges in Resources

From student data, (78.4%) of students identified as challenged by Inadequacy of equipment, (73.8%) by Inadequacy of Raw materials, (28.7%) by Equipment not related to subjects, (28.1%) were faced challenge in Raw materials not related to subjects, and only (8.7%)

faced challenge in power supply. whereas teacher data, (82.1%) of teachers faced challenges due to Inadequacy of equipment, (73.1%) faced Inadequacy of Raw materials, (46.3%) faced Equipment not related to subjects, (31.3%) faced Raw materials not related to subjects, and Problems in power supply faced (14.9%) of the teacher. Furthermore, from qualitative data the insufficiency of equipment and raw materials emerged as a major concern, impacting the quality of practical education.

The finding of this it clear that students and teachers both faced the same ratio of challenge, the only issue of Equipment not related to the subject having little difference response in percentage shown in Figure 11.

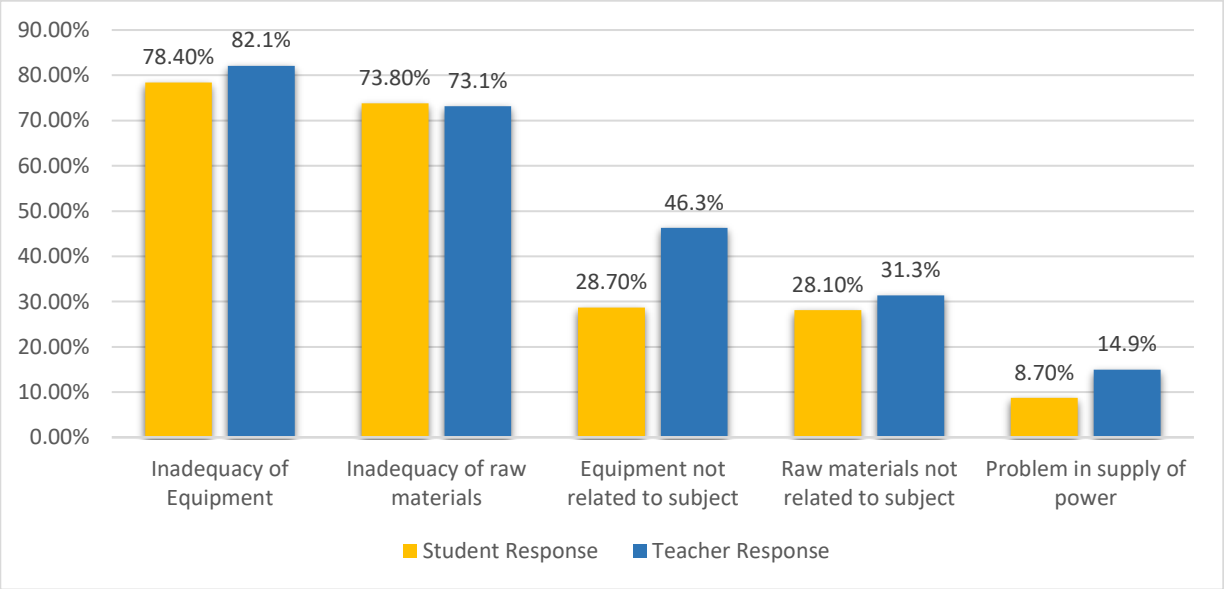

Figure 11: Challenges Faced in Conducting Practical Class (Resources)

4.2.3 The number of classes, duration of the class, and insufficient area of the classroom

The number of classes and duration of classes is not a significant challenge cause only a few students and teachers face these challenges but (47.5%) of students and (59.7%) of teachers say that classroom areas are insufficient for conducting a good practical class shown in Figure 12. Qualitative data discussed the reason for this challenge. Adding more technology and increasing the enrollment of students without any new infrastructure create this challenge. In the present strategy, the government was to increase the students of TVET Both the Heads of the

departments and Principals of the institute strongly expressed that due to the present infrastructure, more enrollment creates inadequacy of infrastructure, including insufficient workshop facilities and classroom space and decreases the quality of TVET.

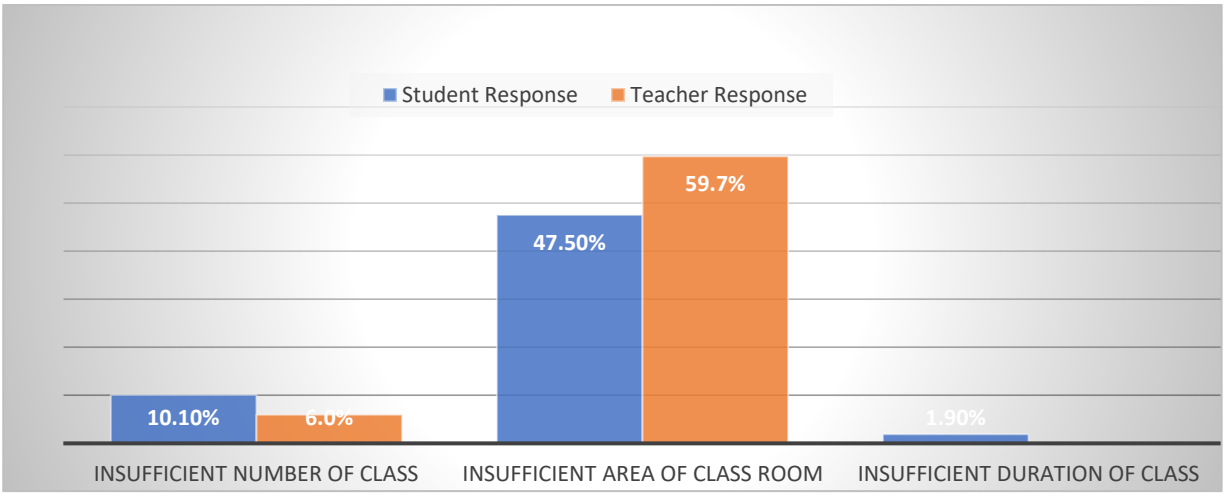

Figure 12: Challenges Faced in Conducting Practical Class (Number of Classes, duration of class, and insufficient area of Classroom)

4.2.4 Syllabus did not match Market demand

(32%) of students and (37.3%) of teachers say that the Syllabus did not match Market demand shown in Figure 13. This study collects data from different technologies in different polytechnics. Analyzing qualitative data observed that some technologies with steady syllabi such as Civil, Electrical, and some technology need to frequently change their syllabus for market demand such as computers, electronics, etc., and for that students with frequently changing technology only respond.

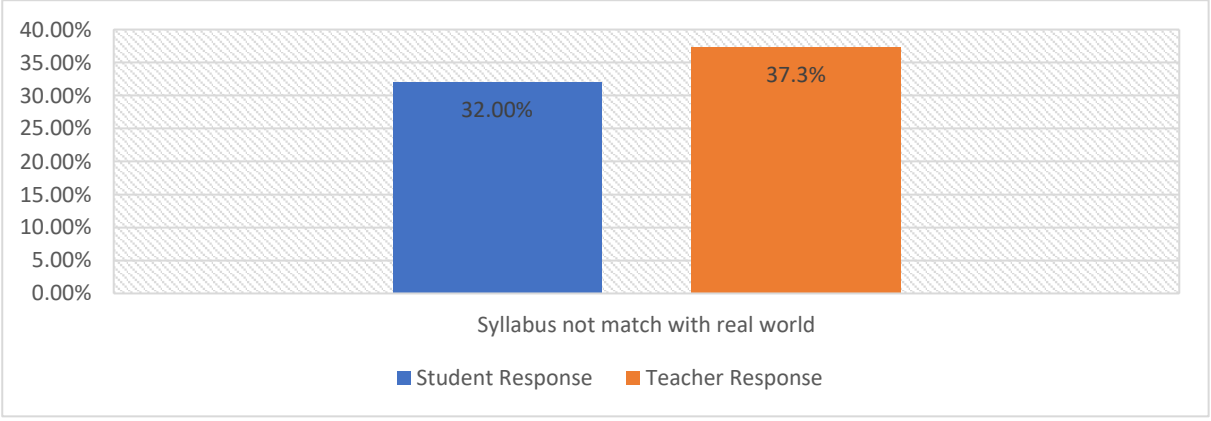

Figure 13: Challenges Faced in Conducting Practical Class (Syllabus did not match with Market Demand)

4.2.5 Student Engagement and Participation

Findings from quantitative and qualitative data, student engagement and participation emerged positively, with the majority of students expressing interest in practical classes. However, concerns were raised regarding the need for active engagement strategies to enhance student participation and learning outcomes further.

4.2.6 Teachers and Lab staff recruitment

In the present status of teacher recruitment rules, no need for any industrial practical experience which is a gap in demands between the institute and Industry. Those educated in general education have been appointed as craft instructors who are not skilled for practical classes which makes a major problem for practical classes.

Another challenge, a significant percentage of teachers who were recruited by a project have not received their salary for over 4 years. Till now they are serving without salary but already most of them cannot be attentive in their class.

4.3 Way Forward

Findings of Way Forward By using multiple response frequency analysis and analyzing all recommendations find some major recommendations by priority and a few recommendations for way forward neglected due to their percentage of the response. Shown in Figure 14.

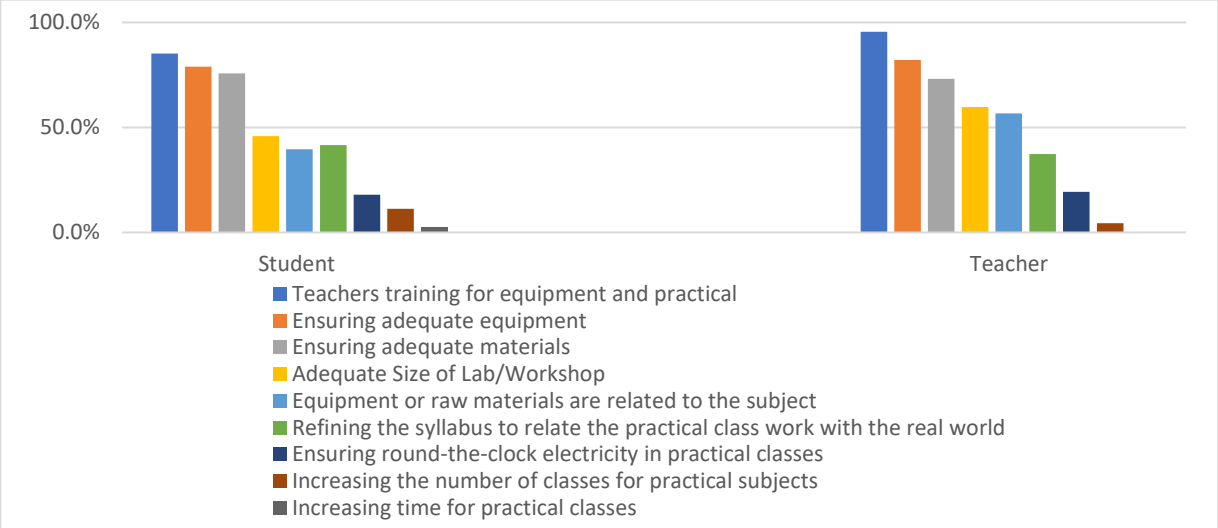

Figure 14: Recommendation with a priority-based Way Forward (Teacher & Student Response)

4.3.1 Teacher and Staff Training

Student response for recommendation is Teachers' Training (85.2%) and the recommendation from the teacher is (95.5%). Recommendations for enhancing teacher training and professional development emerged as a crucial theme. Both Heads of the departments and Principals of the institute emphasized the importance of continuous training to equip instructors with the necessary skills and knowledge to deliver practical education effectively.

4.3.2 Resources

Student response for recommendation Ensuring adequate equipment (79%), and teacher recommendation (82.1%), student response for recommendation Ensuring adequate Raw materials (75.7%), and the recommendation from the teacher for Ensuring adequate Raw materials (73.1%). Ensure Equipment or raw materials are related to the subject, student recommendation (39.6%), and teacher recommendation (56.7%). Form FGD's recommendation for changing the syllabus ensures new equipment and raw materials for the new syllabus.

4.3.3 Infrastructure

For Adequate Size of the workshop or classroom student recommendation is (45.9%) and recommendation from teacher (59.7%). FGD and KII also recommended and added a recommendation for female students' opportunities should be increased and the infrastructures of the polytechnic should be developed accordingly. Data analysis also shows that public polytechnic institutes face this problem much more than private polytechnic institutes cause public polytechnics add new technology and enrollment of students increases day by day. In contrast, private polytechnics have fewer students and technology.

4.3.4 Refining Syllabus to the Market Demand

Student recommendation for refining the syllabus to relate the practical class to the market demand (41.5%) and recommendation from the teacher (37.3%). The mismatch between

the syllabus and real-world industry requirements emerged as a significant theme Both the Head of the departments and Principals of the institute expressed concerns regarding the relevance of the curriculum, emphasizing the need for curriculum revisions to ensure alignment with industry demands and enhance students' readiness for the workforce.

4.3.5 Student Engagement and Participation

FGD & KII both suggest that Trained teachers and craft instructors can improve students' skills and thinking of innovation. Real-world-based practical classes can improve the engagement of students in practical classes. PBL also be suggested by some heads of departments

4.3.6 Teachers and Lab staff recruitment

All heads of the department and principals of the institute Recommended that recruitment rules for teachers and craft instructors must have practical skills with industrial respect. In both FGD and KII, it is recommended that all the teachers appointed in the project are now experienced, and all of them can be integrated as teachers in the revenue sector.

4.3.7 Pre-Process for Enrollment of Students

To fulfill of government's strategy for more enrollment of students, it is very essential that before the enrollment of students must recruit teachers and craft instructors, train teaching staff, improve infrastructure, ensuring equipment and raw materials.

Finally, by implementing recommendations polytechnic institutes can enhance the quality of practical education and better prepare students for the demands of the workforce.

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Chapter Five: Discussion, Conclusion, and Recommendations

This chapter delves into a comprehensive discussion, conclusion, and set of recommendations derived from an in-depth analysis of polytechnic education within the Barishal Division. Through meticulous examination of demographic trends, attendance patterns, resource sufficiency, assessment practices, and other key factors, this chapter offers valuable insights into the current state of polytechnic education in the region. By scrutinizing both quantitative data and qualitative feedback from students, teachers, department heads, and principals, this discussion aims to identify strengths, challenges, and areas for improvement within the educational landscape. Subsequently, the chapter draws informed conclusions and proposes actionable recommendations geared toward enhancing the quality, effectiveness, and relevance of polytechnic education.

5.1 Discussion of Results

Attendance and Completion of Tasks

Attendance rates are relatively satisfactory, with the majority of students attending practical classes regularly. However, private polytechnics exhibit slightly poorer performance in completing tasks within a semester compared to public institutions.

Attendance Patterns: With an average of 6 practical classes held per week, it's encouraging to note that a majority of students (55.7%) attend almost all classes. This indicates a high level of engagement and commitment to their studies. However, there is a concern regarding the 6.9% of students who attend below 33% of classes. This minority may face challenges that affect their attendance, such as personal issues, academic difficulties, or external commitments.

Completion of Tasks: The analysis considers the structure of the semester and the time allocated for various assessments and revisions. It's noted that completing tasks within the semester requires careful planning and efficient use of class time. The calculation suggests that,

theoretically, it's possible to complete 33 tasks within the semester if two classes are needed for each task. The comparison between private and public polytechnics reveals a performance disparity, with private polytechnics showing a lower mean completion rate (17.79) compared to public ones (22.82). This indicates a potential difference in the efficiency or effectiveness of task completion processes between the two types of institutions.

Student Activity and Sufficiency of Equipment: The high level of student activity in practical classes indicates engagement, but concerns arise regarding the sufficiency of equipment and raw materials, particularly in private institutions where availability is lower than in public ones.

Assessment Practices and Teacher-Student Ratio: There is a discrepancy between prescribed assessment criteria and actual practices, with teachers not consistently following guidelines set by the regulatory body. Additionally, the teacher-student ratio falls short of the recommended ratio, indicating a shortage of teaching staff.

Interest in Practical Classes and Skill Development: The majority of students express interest in practical classes, but skill development levels are moderate, suggesting trained teachers, real-world-based syllabus and equipment, and classroom space for improvement in enhancing practical skills among students.

Syllabus Alignment and Problems in Practical Classes: While students generally perceive the syllabus to be aligned with the market demand, there are disparities across different technologies. Common problems in practical classes include insufficiently trained teachers, inadequate equipment and raw materials, and mismatches between syllabi and real-world applications. The syllabus needs to be changed regularly to industry demands.

Recruitment Rules of Teacher and Craft Instructor: TVET teaching staff must have experience in practical work in industrial environments. From general education, a lot of craft

instructors were recruited. They should train in subjective practical and in future recruitment rules will be changed to get trained craft instructors and teachers.

5.2 Conclusion

In conclusion, the quantitative and qualitative analysis of polytechnic education in the Barishal Division sheds light on various facets of the educational landscape, highlighting both strengths and areas requiring attention. The data indicates a commendable level of student attendance and interest in practical classes, reflecting a positive inclination towards hands-on learning. However, significant challenges exist, particularly in terms of resource availability, Infrastructure, shortage of teachers, teacher training, recruitment rules, and alignment with real-world applications.

The disparity between private and public institutions underscores the need for targeted interventions to address shortcomings in resource allocation and educational practices. Public institutions demonstrate comparatively better infrastructure and completion rates, suggesting the importance of adequate funding and governance in supporting educational outcomes. On the other hand, private institutions face hurdles such as limited resources and insufficiently trained faculty, emphasizing the urgency of targeted support mechanisms.

Furthermore, the findings reveal discrepancies between prescribed assessment criteria and actual practices, signaling the importance of ensuring consistency and fairness in evaluation processes. The shortage of teaching staff exacerbates these challenges, highlighting the need for concerted efforts to recruit and retain qualified educators.

Addressing the identified issues, such as improving attendance, enhancing task completion rates, ensuring equipment sufficiency, aligning syllabi with industry demands, and revising recruitment rules, will be crucial for enhancing the quality and effectiveness of polytechnic education in the region. By implementing targeted interventions and fostering collaboration among stakeholders, the polytechnic institutions can better prepare students for

successful careers in their respective fields. In light of these findings, it is imperative for stakeholders, including policymakers, educational institutions, and industry partners, to collaborate on comprehensive strategies to address the identified challenges and capitalize on opportunities. This entails prioritizing investments in infrastructure, teacher and craft instructor recruitment, teacher training, and curriculum development, to ensure the relevance and applicability of educational programs.

5.3 Recommendations

Teachers and staff Training: Prioritize training programs for teachers to enhance their proficiency in handling equipment and conducting practical classes effectively and training will be provided with the demand of industry or real work field. Recruited craft instructors with general education backgrounds also need proper training for handling equipment and conducting practical classes.

Resource Allocation: Allocate sufficient funds and resources to ensure adequate equipment and raw materials in both private and public polytechnics.

Development of Infrastructure: Infrastructure plays a crucial role in providing a conducive learning environment and supporting the effective delivery of polytechnic education. Here are some recommendations to improve infrastructure in polytechnic institutions within the Barishal Division:

a) Allocate funds for infrastructure development projects to address identified deficiencies and modernize facilities.
b) Expand existing facilities or construct new buildings to accommodate the growing student population and evolving educational needs.
c) Upgrade infrastructure to meet modern standards and ensure compatibility with emerging technologies and pedagogical practices.

d) Implement measures to improve accessibility for students with disabilities, including wheelchair ramps, accessible restrooms, and assistive technologies.
e) Prioritize safety enhancements such as fire safety systems, emergency exits, first aid stations, and proper ventilation in laboratories and workshops.
f) Develop a long-term infrastructure plan that aligns with the strategic goals and vision of polytechnic institutions.

Curriculum Review: Regularly review and refine the curriculum to better align with real-world applications, ensuring graduates are equipped with relevant skills. Industrial demands are an important factor for curriculum review.

Improving Teacher-Student Ratio: Address the shortage of teaching staff by recruiting more qualified instructors to achieve a balanced teacher-student ratio. Present project-based recruited teachers can be included as regular teachers by proper policy.

Encouraging Student Engagement: Implement strategies to further engage students in practical classes, fostering active participation and skill development.

Monitoring and Compliance: Establish mechanisms for monitoring and enforcing compliance with assessment guidelines to ensure fairness and consistency in evaluation practices.

By implementing these recommendations, polytechnic institutions in the Barishal Division can address existing challenges and create a conducive learning environment that equips students with the skills and knowledge needed for success in their chosen fields.

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APPENDIX A (Questionnaire)

A.1 Questionnaire for Students

Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward.

পলিটেকনিক শিক্ষার্থীদের জন্য প্রশ্নমালা

প্রিয় শিক্ষার্থী,

কারিগরি শিক্ষা অধিদপ্তর ২০২৩-২৪ অর্থবছরে অধিদপ্তরের রিসার্স উইং এর মাধ্যমে " Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward. শীর্ষক গবেষণা পরিচালনা করছে। এই গবেষণায় বাস্তব অভিজ্ঞতা ভিত্তিক তথ্য ও উপাত্ত সংগ্রহের জন্য এই প্রশ্নমালাটি তৈরি করা হয়েছে। কারিগরি শিক্ষার একজন শিক্ষার্থী হিসেবে বাস্তবভিত্তিক তথ্য সরবরাহের জন্য আপনাকে একজন গুরুত্বপূর্ণ তথ্যদাতা হিসেবে নির্বাচন করা হয়েছে।

প্রশ্নগুলোর কোন কোনটিতে তথ্য প্রদানের জন্য নির্দিষ্ট খালি জায়গা রয়েছে, আবার কোন কোন প্রশ্নের একাধিক বিকল্প তথ্য সরবরাহ করা হয়েছে। অনুগ্রহ করে খালি জায়গায় আপনার জানা তথ্য লিখুন এবং সরবরাহকৃত বিকল্প তথ্যের ক্ষেত্রে প্রযোজ্য বাম পাশের খালি বক্সে টিক দিন।

প্রিয় শিক্ষার্থী, এক্ষেত্রে আপনার সরবরাহকৃত তথ্য শুধুমাত্র গবেষণার কাজেই ব্যবহার করা হবে। আপনার নাম ও পরিচয় সম্পূর্ন গোপন রাখা হবে।

প্রশ্নমালাটি পূরণ করতে আনুমানিক ৩০ মিনিট সময় লাগতে পারে। অনুগ্রহপূর্বক প্রশ্নমালার নির্দেশনা অনুযায়ী যথাযথ ভাবে তা পূরণ করে গবেষণা কাজে সহায়তা করার জন্য বিনীত অনুরোধ করছি।

উপরোক্ত বিষয় বিবেচনায় গবেষণা কাজে তথ্য দিয়ে সহযোগিতা করতে সম্মত আছেন কি? ☐ হ্যাঁ ☐ না

Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward.

পলিটেকনিক শিক্ষার্থীদের জন্য প্রশ্নমালা

সাধারণ তথ্য:

১। আপনার সেমিষ্টার _____

২। আপনার টেকনোলজির নাম _____

৩। আপনার ইন্সটিটিউটের নাম _____

৪। ইন্সটিটিউটের ধরন ☐ প্রাইভেট ☐ পাবলিক

ব্যবহারিক ক্লাসের সামগ্রিক অবস্থা সংক্রান্ত তথ্য:

৫। আপনার ক্লাশ রুটিনে ১ সপ্তাহে কয়টি ব্যবহারিক ক্লাশ ছিল? _____টি

৬। আপনার রুটিন অনুযায়ী গড়ে ১ সপ্তাহে কয়টি ব্যবহারিক ক্লাশ হয়েছে? _____টি

৭। আপনি গড়ে ১ সপ্তাহে কয়টি ব্যবহারিক ক্লাশ করেছেন? _____ টি

৮। এই সেমিস্টারে ব্যবহারিক ক্লাশে কয়টি পূর্নাঙ্গ ব্যবহারিক জব করেছেন? _____ টি

৯। ব্যবহারিক ক্লাশে আপনি কতটা আগ্রহী ছিলেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১০। সামগ্রিকভাবে ব্যবহারিক ক্লাশে যন্ত্রপাতির পর্যাপ্ততার মাত্রা কেমন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১১। বিষয়ের সাথে সংশ্লিষ্ঠ যন্ত্রপাতির পর্যাপ্ততার অবস্থা কী?

☐ সব বিষয়ে আছে ☐ অনেক বিষয়ে আছে ☐ কিছু বিষয়ে আছে ☐ অল্প বিষয়ে আছে ☐ কোনো বিষয়ে নাই

১২। সামগ্রিক ভাবে ব্যবহারিক ক্লাশে কাচামালের পর্যাপ্ততার মাত্রা কেমন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৩। বিষয়ের সাথে সংশ্লিষ্ঠ কাচামালের পর্যাপ্ততার অবস্থা কী?

☐ সব বিষয়ে আছে ☐ অনেক বিষয়ে আছে ☐ কিছু বিষয়ে আছে ☐ অল্প বিষয়ে আছে ☐ কোনো বিষয়ে নাই

১৪। ব্যবহারিক ক্লাশ কতটুকু বিদ্যুৎ নির্ভর?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৫। ব্যবহারিক ক্লাশের সময়ে বিদ্যুৎ সরবরাহ কেমন থাকে?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৬। ব্যবহারিক ক্লাশ চলাকালীন ব্যবহারিক কাজ সম্পন্ন করার ক্ষেত্রে আপনার ভূমিকা কীরূপ?

☐ আপনি নিজে করেছেন ☐ শিক্ষকের কিছু সহযোগিতা ছিল ☐ বেশির ভাগ শিক্ষক করেছেন ☐ সম্পূর্ন শিক্ষক ই করেছেন আপনি দেখেছেন ☐ আপনি বা শিক্ষক কেউ করেননি

১৭। ১টি সেমিস্টারে বিষয় ভিত্তিক ব্যবহারিক ক্লাশের সংখ্যা আপনি পর্যাপ্ত বলে মনে করেন কি? ☐ হ্যাঁ ☐ না

১৭.১ উত্তর না হলে, একটি সেমিস্টারে কোনো একটি বিষয়ে কমপক্ষে কয়টি ব্যবহারিক ক্লাশ হলে ভালো হয় বলে আপনি মনে করেন?

_____ টি

১৭.২ এক্ষেত্রে আপনার যুক্তি কী ? _____

_____

_____

১৮। ১টি ব্যবহারিক ক্লাশের জন্য যতটুকু সময় নির্ধারিত আছে আপনি কি তা পর্যাপ্ত বলে মনে করেন? ☐ হ্যাঁ ☐ না

১৮.১ উত্তর না হলে ব্যবহারিক ক্লাশের জন্য কতটুকু সময় হলে ভালো হয় বলে আপনি মনে করেন? _____মিনিট

১৯। ব্যবহারিক ক্লাশ আপনার পঠিত বিষয়টি বুঝতে কতটুকু সাহায্য করছে বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২০। ব্যবহারিক ক্লাশের অর্জিত দক্ষতা দ্বারা পরবর্তীতে অনুরূপ কাজ একাই সম্পন্ন করতে আপনি কতটা আত্মবিশ্বাসী বলে মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২১। ব্যবহারিক ক্লাশের মাধ্যমে আপনার দক্ষতা কী মাত্রায় বৃদ্ধি পেয়েছে বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২২। ব্যবহারিক ক্লাশের দ্বারা আপনার উদ্ভাবনী চিন্তা কী মাত্রায় বৃদ্ধি পেয়েছে বলে আপনার মনে হয়?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৩। শিক্ষার্থীর সংখ্যা অনুপাতে ব্যবহারিক ক্লাশের আয়তন কতটা পর্যাপ্ত বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৪। ব্যবহারিক ক্লাশ বাস্তব জগতের কাজের সাথে কতটুকু মিল রাখে বলে আপনার মনে হয়?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৫। ব্যবহারিক ক্লাশে নিম্নের কোন কোন বিষয়ে প্রতিবন্ধকতা রয়েছে বলে আপনি মনে করেন? (প্রয়োজনে একাধিক বিষয় চিহ্নিত করুন)

☐ যন্তপাতির অপর্যাপ্ততা
☐ কাঁচামালের অপর্যাপ্ততা
☐ যন্ত্রপাতি বিষয়ের সাথে সম্পর্কিত নয়
☐ কাঁচামাল বিষয়ের সাথে সম্পর্কিত নয়
☐ শিক্ষকদের যন্ত্রপাতি বা ব্যবহারিক বিষয়ে প্রশিক্ষণ নাই
☐ ব্যবহারিক বিষয়ের জন্য ক্লাশের সংখ্যা কম
☐ ব্যবহারিক ক্লশের জন্য সময় পর্যাপ্ত নয়
☐ ল্যাব/ওয়ার্কশপ এর আয়তন পর্যাপ্ত নয়
☐ বাস্তব জগতের সাথে ব্যবহারিক ক্লাশের কাজের সম্পর্ক নাই বা কম
☐ বিদ্যুৎতের সমস্যা
☐ অন্যান্য (লিখুন): _____

_____

২৬। ব্যবহারিক ক্লাশের উন্নতির জন্য আপনার পরামর্শ কী? (প্রয়োজনে একাধিক বিষয় চিহ্নিত করুন)

- ☐ পর্যাপ্ত যন্তপাতির নিশ্চয়তা
- ☐ পর্যাপ্ত কাঁচামালের নিশ্চয়তা
- ☐ যন্ত্রপাতি বা কাঁচামাল বিষয়ের সাথে সম্পর্কিত হওয়া
- ☐ শিক্ষকদের যন্ত্রপাতি বা ব্যবহারিক বিষয়ে প্রশিক্ষণ দেয়া
- ☐ ব্যবহারিক বিষয়ের জন্য ক্লাশের সংখ্যা বাড়ানো
- ☐ ব্যবহারিক ক্লাশের জন্য সময় বৃদ্ধি করা
- ☐ ল্যাব/ওয়ার্কশপ এর আয়তন পর্যাপ্ত করা
- ☐ সিলেবাস পরিমার্যিত করে বাস্তব জগতের সাথে ব্যবহারিক ক্লাশের কাজের সম্পর্ক করা
- ☐ ব্যবহারিক ক্লাশে সার্বক্ষনিক বিদ্যুৎ নিশ্চায়ন করা
- ☐ অন্যান্য (লিখুন): _____

_____

ব্যক্তিগত তথ্য **(**প্রয়োজনে পরবর্তী যোগাযোগের জন্য**):**

২৭। আপনার নামঃ _____

২৮। আপনার মোবাইল নম্বরঃ _____

২৯। ইমেইলঃ _____

আপনার সহযোগিতার জন্য ধন্যবাদ

A.2 Questionnaire for Teachers

Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward.

পলিটেকনিক শিক্ষকদের জন্য প্রশ্নমালা

সন্মানিত শিক্ষক,

কারিগরি শিক্ষা অধিদপ্তর ২০২৩-২৪ অর্থবছরে অধিদপ্তরের রিসার্স উইং এর মাধ্যমে " Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward. শীর্ষক গবেষণা পরিচালনা করছে। এই গবেষণায় বাস্তব অভিজ্ঞতা ভিত্তিক তথ্য ও উপাত্ত সংগ্রহের জন্য এই প্রশ্নমালাটি তৈরি করা হয়েছে। কারিগরি শিক্ষার একজন শিক্ষক হিসেবে বাস্তবভিত্তিক তথ্য সরবরাহের জন্য আপনাকে একজন গুরুত্বপূর্ণ তথ্যদাতা হিসেবে নির্বাচন করা হয়েছে।

প্রশ্নগুলোর কোন কোনটিতে তথ্য প্রদানের জন্য নির্দিষ্ট খালি জায়গা রয়েছে, আবার কোন কোন প্রশ্নের একাধিক বিকল্প তথ্য সরবরাহ করা হয়েছে। অনুগ্রহ করে খালি জায়গায় আপনার জানা তথ্য লিখুন এবং সরবরাহকৃত বিকল্প তথ্যের ক্ষেত্রে প্রযোজ্য বাম পাশের খালি বক্সে টিক দিন।

সন্মানিত শিক্ষক, এক্ষেত্রে আপনার সরবরাহকৃত তথ্য শুধুমাত্র গবেষণার কাজেই ব্যবহার করা হবে। আপনার নাম ও পরিচয় সম্পূর্ন গোপন রাখা হবে।

প্রশ্নমালাটি পূরণ করতে আনুমানিক ৩০ মিনিট সময় লাগতে পারে। অনুগ্রহপূর্বক প্রশ্নমালার নির্দেশনা অনুযায়ী যথাযথ ভাবে তা পূরণ করে গবেষণা কাজে সহায়তা করার জন্য বিনীত অনুরোধ করছি।

উপরোক্ত বিষয় বিবেচনায় গবেষণা কাজে তথ্য দিয়ে সহযোগিতা করতে সম্মত আছেন কি? ☐ হ্যাঁ ☐ না

Status of practical classes of polytechnic students in Barishal division: Focusing on skills, challenges & way forward.

পলিটেকনিক শিক্ষকদের জন্য প্রশ্নমালা

সাধারণ তথ্য:

১। আপনার টেকনোলজির নাম: _____

২। আপনার ইন্সটিটিউটের নাম: _____

৩। ইন্সটিটিউটের ধরন: ☐ প্রাইভেট ☐ পাবলিক

৪। আপনার পদবী: _____

৫। আপনার নিয়োগের ধরন:

☐ রাজস্ব খাতে ক্যাডার ☐ রাজস্ব খাতে নন-ক্যাডার ☐ প্রকল্প খাতে ☐ খন্ড-কালীন

☐ অন্যান্য (লিখুন): _____

৬। আপনার সর্বোচ্চ শিক্ষাগত যোগ্যতা: _____

৭। শিক্ষক হিসাবে অভিজ্ঞতা

☐ ১৫ বছরের বেশি ☐ ১০ থেকে ১৫ বছর ☐ ৫ থেকে ১০ বছর ☐ ২ থেকে ৫ বছর ☐ ১ বছর বা তার চেয়ে কম

৮। ব্যবহারিক বিষয়ে আপনার কোনো প্রশিক্ষণ থাকলে তা উল্লেখ করুন:

_____

_____

৯। প্রশিক্ষণ না থাকলে কী ধরনের অসুবিধা হয় তা লিখুন:

_____

_____

ব্যবহারিক ক্লাস সম্পর্কিত তথ্য:

১০। বর্তমান সেমিস্টারে আপনার পাঠদানের বিষয়গুলোতে কতটি ব্যবহারিক ক্লাশ ছিল? _____ টি

১১। বর্তমান সেমিস্টারে আপনার পাঠদানের বিষয়গুলোতে কতটি ব্যবহারিক ক্লাশ সম্পন্ন হয়েছে? _____ টি

১২। ব্যবহারিক ক্লাশে আপনি কতটুকু সক্রিয় থাকেন মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৩। সামগ্রিকভাবে ব্যবহারিক ক্লাশে যন্ত্রপাতির পর্যাপ্ততার মাত্রা কেমন বলে মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৪। বিষয়ের সাথে সংশ্লিষ্ঠ যন্ত্রপাতির পর্যাপ্ততা কেমন বলে মনে করেন?

☐ সব বিষয় আছে ☐ অনেক বিষয় আছে ☐ কিছু বিষয়ে আছে ☐ অল্প বিষয়ে আছে ☐ কোনো বিষয়ে নাই

১৪.১। যন্ত্রপাতি পর্যাপ্ত না থাকলে তার কারনে ব্যবহারিক ক্লাশে কী কী অসুবিধা হয় বলে আপনার মনে হয়?

_____

_____

১৫। সামগ্রিকভাবে ব্যবহারিক ক্লাশে কাচামালের পর্যাপ্ততার মাত্রা কেমন বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৬। বিষয়ের সাথে সংশ্লিষ্ঠ কাচামালের পর্যাপ্ততার মাত্রা কেমন বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৬.১। কাঁচামাল পর্যাপ্ত না থাকলে তার কারনে ব্যবহারিক ক্লাশে কী কী অসুবিধা হয় বলে আপনি মনে করেন?

_____

_____

১৭। আপনার ব্যবহারিক ক্লাশসমূহ কতটুকু বিদ্যুৎ নির্ভর?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৮। ব্যবহারিক ক্লাশের সময়ে বিদ্যুৎ সরবরাহ কেমন থাকে?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৮.১। বিদ্যুৎ সরবরাহ না থাকলে ব্যবহারিক ক্লাশ কতটা ব্যাহত হয় বলে আপনার মনে হয়?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

১৯। ব্যবহারিক ক্লাশে ব্যবহারিক কাজে আপনার ভূমিকা কীরূপ?

☐ সম্পূর্ণ আপনি নিজে করে দেখান

☐ বেশির ভাগ আপনি করে দেখান

☐ মোটামুটি সহযোগিতা করেন

☐ সামান্য সহযোগিতা করেন

☐ আপনি কিছুই করেন না

২০। ১টি সেমিস্টারে বিষয়ভিত্তিক ক্লাশের সংখ্যা পর্যাপ্ত বলে মনে করেন কি? ☐ হ্যাঁ ☐ না

২০.১। উত্তর না হলে, ১টি সেমিস্টারে ১টি বিষয়ে কতটি বেশি ব্যবহারিক ক্লাশ রাখা যুক্তিযুক্ত বলে মনে করেন? _____ টি

২১। প্রতিটি ব্যবহারিক ক্লাশের জন্য যে সময় নির্ধারিত আছে তা পর্যাপ্ত বলে মনে করেন কি? ☐ হ্যাঁ ☐ না

২১.১। উত্তর না হলে, ১টি ব্যবহারিক ক্লাশের জন্য কতটুকু সময় বরাদ্দ করা যুক্তিযুক্ত বলে মনে করেন? _____ মিনিট

২২। আপনার ব্যবহারিক ক্লাশ শিক্ষার্থীরা কতটুকু বুঝতে পারে বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৩। শিক্ষার্থীর সংখ্যা অনুপাতে ব্যবহারিক ক্লাশের আয়তন কতটা পর্যাপ্ত বলে আপনি মনে করেন?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৩.১। আয়তন পর্যাপ্ত না হলে ব্যবহারিক ক্লাশে কী অসুবিধা হয় বলে আপনি মনে করেন?

_____

_____

২৪। শিক্ষার্থীরা ব্যবহারিক ক্লাশে যেভাবে শেখে তা বাস্তব জগতের কাজের সাথে কতটুকু সামঞ্জস্যপূর্ণ বলে আপনার মনে হয়?

☐ ৮০%-১০০% ☐ ৬০%-৭৯% ☐ ৪০%-৫৯% ☐ ২০%-৩৯% ☐ ২০% এর নিচে

২৪.১। বাস্তব জগতের কাজের সাথে তেমন একটা মিল না থাকলে তাতে কী প্রভাব পড়ে বলে আপনি মনে করেন?

_____

_____

২৫। আপনি ব্যবহারিক ক্লাশের মূল্যায়ন কীভাবে করে থাকেন? (প্রয়োজনে একাধিক বিষয় চিহ্নিত করুন)

☐ শিক্ষার্থীকে প্রশ্ন করে

☐ শিক্ষার্থীর ব্যবহারিক কাজ দেখে

☐ শিক্ষার্থীর হাজিরার উপর

☐ জব রিপোর্ট

☐ অন্যান্য (লিখুন): _____

_____

২৬। ব্যবহারিক ক্লাশে নিচের কোন কোন বিষয়ে প্রতিবন্ধকতা রয়েছে বলে মনে করেন? (প্রয়োজনে একাধিক বিষয় চিহ্নিত করুন)

☐ যন্তপাতির অপর্যাপ্ততা

☐ কাঁচামালের অপর্যাপ্ততা

☐ যন্ত্রপাতি বিষয়ের সাথে সম্পর্কিত নয়

☐ কাঁচামাল বিষয়ের সাথে সম্পর্কিত নয়

☐ শিক্ষকদের যন্ত্রপাতি বা ব্যবহারিক বিষয়ে প্রশিক্ষণ নাই

☐ ব্যবহারিক বিষয়ের জন্য ক্লাশের সংখ্যা কম

☐ ব্যবহারিক ক্লশের জন্য সময় পর্যাপ্ত নয়

☐ ল্যাব/ওয়ার্কশপ এর আয়তন পর্যাপ্ত নয়

☐ বাস্তব জগতের সাথে ব্যবহারিক ক্লাশের কাজের সম্পর্ক নাই বা কম

☐ বিদ্যুৎতের সমস্যা

☐ অন্যান্য (লিখুন): _____

_____

_____

২৭। ব্যবহারিক ক্লাশের উন্নতির জন্য আপনার পরামর্শ কী? (প্রয়োজনে একাধিক বিষয় চিহ্নিত করুন)

☐ পর্যাপ্ত যন্তপাতির নিশ্চয়তা

☐ পর্যাপ্ত কাঁচামালের নিশ্চয়তা

☐ যন্ত্রপাতি বা কাঁচামাল বিষয়ের সাথে সম্পর্কিত হওয়া

☐ শিক্ষকদের যন্ত্রপাতি বা ব্যবহারিক বিষয়ে প্রশিক্ষণ দেয়া

☐ ব্যবহারিক বিষয়ের জন্য ক্লাশের সংখ্যা বাড়ানো

☐ ব্যবহারিক ক্লাশের জন্য সময় বৃদ্ধি করা

☐ ল্যাব/ওয়ার্কশপ এর আয়তন পর্যাপ্ত করা

☐ সিলেবাস পরিমার্যিত করে বাস্তব জগতের সাথে ব্যবহারিক ক্লাশের কাজের সম্পর্ক করা

☐ ব্যবহারিক ক্লাশে সার্বক্ষনিক বিদ্যুৎ নিশ্চায়ন করা

☐ অন্যান্য (লিখুন): _____

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_____

ব্যক্তিগত তথ্য **(**প্রয়োজনে পরবর্তী যোগাযোগের জন্য**):**

২৮। আপনার নামঃ _____

২৯। আপনার মোবাইল নম্বরঃ _____

৩০। ইমেইলঃ _____

আপনার সহযোগিতার জন্য ধন্যবাদ

APPENDIX B (Interview Guide)

B.1 Interview Guide for Principal (KII)

Issue 1: ইন্সটিটিউট সংক্রান্ত তথ্যঃ

- টেকনোলজির সংখ্যা
- টেকনোলজি ভিত্তিক শিক্ষার্থীর সংখ্যা
- ল্যাব/ ওয়ার্কশপ সংখ্যা
- টেকনোলজি ভিত্তিক ল্যাব/ ওয়ার্কশপ সংখ্যা
- ল্যাব/ ওয়ার্কশপ এর আয়তন।

Issue 2: ইন্সটিটিউটে কর্মরত শিক্ষকদের তথ্যঃ

- শিক্ষকদের পদ সংখ্যা
- কর্মরত শিক্ষকের সংখ্যা
- টেকনোলজি ভিত্তিক শিক্ষকদের পদ সংখ্যা
- টেকনোলজি ভিত্তিক কর্মরত শিক্ষকের সংখ্যা
- রাজস্ব খাতে, প্রজেক্ট খাতে ও খন্ডকালীন শিক্ষকের সংখ্যা
- কর্মরত শিক্ষকদের ব্যবহারিক বিষয়ে প্রশিক্ষণ
- কর্মরত শিক্ষকদের বিষয় ভিত্তিক ব্যবহারিক বিষয়ে প্রশিক্ষণ
- কর্মরত শিক্ষকদের অভিজ্ঞতা

Isuue 3: ব্যবহারিক ক্লাশ সংক্রান্ত তথ্যঃ

- গড়ে প্রতি সেমিস্টারে ব্যবহারিক ক্লাশের সংখ্যা
- গড়ে প্রতি সেমিস্টারে অনুষ্ঠিত ব্যবহারিক ক্লাশের সংখ্যা
- ব্যবহারিক ক্লাশ কম হলে তার কারণ
- শিক্ষার্থীর বুঝতে পারা
- শিক্ষার্থীদের দক্ষতা

Issue 4: যন্ত্রপাতি ও কাঁচামাল সংক্রান্ত তথ্যঃ

- যন্ত্রপাতির প্রাপ্যতা
- সিলেবাস সংশ্লিষ্ঠ যন্ত্রপাতি
- কাচঁমালের প্রাপ্যতা
- সিলেবাস সংশ্লিষ্ঠ কাঁচামাল
- বাস্তব জগতের সাথে সামজস্যপূর্ণ যন্ত্রপাতি ও কাঁচামাল

Issue 5: ব্যবহারিক ক্লাশের অসুবিধার তথ্যঃ

- ওয়ার্কশপ/ ল্যাবের আয়তন সংশ্লিষ্ঠ
- ক্লাশের সময় বিদ্যুতের অবস্থা সংশ্লিষ্ঠ
- শিক্ষক স্বল্পতা বা শিক্ষক-ছাত্র অনুপাত সংশ্লিষ্ঠ
- কর্মরত শিক্ষকদের ব্যবহারিক বিষয়ে প্রশিক্ষণ
- কর্মরত শিক্ষকদের বিষয় ভিত্তিক ব্যবহারিক বিষয়ে প্রশিক্ষণ
- অন্যান্য

Issue 6: ব্যবহারিক ক্লাশের ব্যাপারে পরামর্শঃ

- যন্ত্রপাতি সংশ্লিষ্ঠ
- কাচাঁমাল সংশ্লিষ্ঠ
- বিদ্যুৎ সংশ্লিষ্ঠ
- ওয়ার্কশপ/ ল্যাবের আয়তন সংশ্লিষ্ঠ
- শিক্ষক স্বল্পতা সংশ্লিষ্ঠ
- শিক্ষক প্রশিক্ষণ সংশ্লিষ্ঠ
- অন্যান্য

APPENDIX C (FGD Guide)

C.1 FGD Guideline for Head of the Departments

Issue 1: বিভাগে কর্মরত শিক্ষকদের তথ্যঃ

- বিভাগে শিক্ষকদের পদ সংখ্যা
- কর্মরত শিক্ষকের সংখ্যা
- কর্মরত শিক্ষকদের ব্যবহারিক প্রশিক্ষণ
- কর্মরত শিক্ষকদের বিষয় ভিত্তিক ব্যবহারিক প্রশিক্ষণ
- কর্মরত শিক্ষকদের অভিজ্ঞতা
- ব্যবহারিক ক্লাশে শিক্ষকদের উপস্থাপনা কৌশল

Issue 2: ব্যবহারিক ক্লাশ সংক্রান্ত তথ্যঃ

- গড়ে প্রতি সেমিস্টারে ব্যবহারিক ক্লাশের সংখ্যা
- গড়ে প্রতি সেমিস্টারে অনুষ্ঠিত ব্যবহারিক ক্লাশের সংখ্যা
- ব্যবহারিক ক্লাশ কম হলে তার কারণ
- শিক্ষার্থীদের বুঝতে পারা
- শিক্ষার্থীদের দক্ষতা

Issue 3: যন্তপাতি ও কাঁচামাল সংক্রান্ত তথ্যঃ

- যন্ত্রপাতির প্রাপ্যতা
- সিলেবাস সংশ্লিষ্ঠ যন্ত্রপাতি
- কাচঁমালের প্রাপ্যতা
- সিলেবাস সংশ্লিষ্ঠ কাঁচামাল
- বাস্তব জগতের সাথে সামজস্যপূর্ণ যন্ত্রপাতি ও কাঁচামাল

Isssue 4: ব্যবহারিক ক্লাশের অসুবিধার তথ্যঃ

- ওয়ার্কশপ/ ল্যাবের আয়তন
- ক্লাশের সময় বিদ্যুতের অবস্থা
- শিক্ষক স্বল্লতা বা শিক্ষক-ছাত্র অনুপাত সংশ্লিষ্ঠ
- কর্মরত শিক্ষকদের ব্যবহারিক প্রশিক্ষণ
- কর্মরত শিক্ষকদের বিষয় ভিত্তিক ব্যবহারিক প্রশিক্ষণ
- যন্ত্রপাতি সংশ্লিষ্ঠ
- কাচাঁমাল সংশ্লিষ্ঠ
- ক্লাশের সময় সংশ্লিষ্ঠ
- বাস্তব জগতের সাথে সামজস্যপূর্ণ যন্ত্রপাতি ও কাঁচামাল

Issue 5: ব্যবহারিক ক্লাশের ব্যাপারে পরামর্শঃ

- যন্ত্রপাতি সংশ্লিষ্ঠ
- কাচাঁমাল সংশ্লিষ্ঠ
- বিদ্যুৎ সংশ্লিষ্ঠ।
- ওয়ার্কশপ/ ল্যাবের আয়তন সংশ্লিষ্ঠ
- শিক্ষক স্বল্লতা সংশ্লিষ্ঠ
- শিক্ষক প্রশিক্ষণ সংশ্লিষ্ঠ
- ক্লাশের সময় সংশ্লিষ্ঠ।
- বাস্তব জগতের সাথে সামজস্যপূর্ণ যন্ত্রপাতি ও কাঁচামাল সংশ্লিষ্ঠ

APPENDIX D (Necessary Data)

D.1 Distribution of Students of selected Polytechnic Institute (2nd, 4th, and 6th Semester)

Sl No	Name of Institute	Population	Distribution
1	Barisal Polytechnic Institute, Barisal	3499	158
2	Patuakhali Polytechnic Institute, Patuakhali	1296	66
3	Barguna Polytechnic Institute, Barguna	991	45
4	Bhola Polytechnic Institute, Bhola	857	44
5	Infra Polytechnic Institute, Barisal	832	42
6	Barisal Ideal Polytechnic Institute, Barisal	147	7
7	Barisal Technocrats Polytechnic Institute, Barisal	60	3
8	United Polytechnic Institute, Barisal	28	1
	Total	7710	366

D.2 Total population of Teachers of selected polytechnic Institute

Sl No	Type of Institute	Name of Institute	Total Teacher
1	Public	Barguna Polytechnic Institute, Barguna.	29
2	Public	Patuakhali Polytechnic Institute, Patuakhali	28
3	Public	Bhola Polytechnic Institute, Bhola	27
4	Public	Barisal Polytechnic Institute, Barisal	55
5	Private	Infra Polytechnic Institute, Barisal	39
6	Private	Barisal Ideal Polytechnic Institute, Barisal	14
7	Private	Barisal Technocrats Polytechnic Institute, Barisal	9
8	Private	United Polytechnic Institute, Barisal	8
		Total Teacher Population	209

D.3 Technology-wise number and distribution of students of selected polytechnic Institutes

SL NO	Name of Technology	Number of Students	Distribution
1	Civil Technology	2239	96
2	Electrical Technology	1330	61
3	Mechanical Technology	522	25
4	Computer Science and Technology + Computer technology	1532	72
5	Power Technology	408	20
6	Electro-Medical Technology	291	14
7	Electronics Technology	985	52
8	Refrigeration and Air-Conditioning Technology	238	14
9	Environmental Technology	45	4
10	Architecture Technology	18	2
11	Automobile Technology	24	2
12	Marine Technology	42	2
13	Surveying Technology	36	2
	Total	7110	366

D.4 Technology-wise practical class of a week in the syllabus of BTEB

Technology	2nd Semester	4th Semester	6th Semester	Average of Total
Civil	7	7	8	6.05= 6 Nos of Class in a week
Electrical	6	6	5	
Power	7	7	6	
Mechanical	6	7	6	
Computer	7	7	9	
Environmental	7	7	6	
RAC	6	8	5	
Electronics	5	6	7	
Electromedical	5	6	6	
Marine	6	5	7	
Surveying	7	7	6	
Automobile	6	6	7	
Architecture	7	7	8	

D.5 Research Matrix (Based on Research Questions for Analysis)

SQ=Student Question, TQ= Teacher Question, FGDI=FGD Issue, KIII=KII Issue

Research Question	Key Issues	Key Performance Indicators / Variable	Source of data	Type of data	Data collection methods	Specified Questions and tools
RQ1	Current status of practical classes	1. Attendance of students 2. Numbers of practical Classes 3. Number of Jobs 4. Student's activities in practical classes. 5. Teacher's activities. 6. Availability of equipment 7. Availability of raw materials 8. Level of understanding of practical classes in learning 9. Student's Self-confidence 10. Assessment 11. Teacher Student Ratio 12. Types of Recruitment of Teacher & their Experience 13. Interest in learning. 14. Skill development 15. Innovative idea generation 16. Real word technology	Students & Teachers	Quantitative	Questionnaire	1. SQ7 2. SQ5, SQ6, FGDI-2, KIII-3 3. SQ8 4. SQ16 5. TQ10,11,12,19 6. SQ10,11, TQ13,14, FGDI-3, KIII-4 7. SQ12,13, TQ15,16, FGDI-3, KIII-4 8. SQ19, TQ22, FGDI-2, KIII-3 9. SQ20 10. TQ25 11. KIII-2, FGDI-1, DOC 12. TQ5,6,7, KIII-2 13. SQ9 14. SQ21 15. SQ22 16. SQ24
RQ2	Challenges faced in practical classes	1. Infrastructure 2. Teachers' training related to Equipment 3. Student-space ratio for practical classroom 4. Student-equipment & raw materials ratio 5. Teacher-student ratio 6. Number of classes 7. Duration of practical class 8. Supply of Power 9. Relevancy of practical class activities with real-world practice	Students, Teachers, Head of the Department, Principal of the institute, Documents	Quantitative & Qualitative.	Questionnaire FGD, KII, Institute, and curriculum-related documents.	1. KIII-1, DOC 2. TQ8, FGDI-4, KIII-5 3. SQ23, TQ23,23.1, FGDI-4, KIII-5, DOC 4. TQ13, 14, 14.1, 15, 16,16.1, DOC, KIII-5 5. DOC, FGDI-4, KIII-5 6. SQ17,17.1,17.2, TQ20, 20.1 7. SQ18,18.1, TQ21, 21.1 8. SQ14, 15, TQ17, 18, 18.1, FGDI-4, KIII-5 9. SQ24, FGDI-4, KIII-5 And FOR OVERALL DATA: SQ25, TQ26, FGDI-4, KIII-5
RQ3	Recommendation for overcoming challenges	1. Infrastructure 2. Teacher's training 3. Student-teacher ratio 4. Update curriculum 5. Real-world equipment and raw materials 6. Updated equipment and raw materials 7. Practical class duration 8. Supply of power	Students, Teachers, Head of the department, Principal of the institute	Quantitative & Qualitative	Questionnaire FGD, KII	SQ26, TQ27, FGDI-5, KIII-6