Erasmus+

Erasmus+ - Key Action 2
Capacity Building within the Field of Higher Education

eACCESS Project

Project number: 610041-EPP-1-2019-1-PL-EPPKA2-CBHE-JP

EU-Asia Collaboration for aCcessible Education in Smart Power Systems

WP 1	PREPARATION
TASK	T1.4 Consultations with the relevant third partners, other universities and local industrial stakeholders.
LEAD PARTNER	KEC
PARTICIPATING PARTNERS	RUB, ATM, SCU, PU

Document Status		
Date of Issue	2023/05/16	
Contributors	Manoj Sharma, Namgay Tenzin, Gom Dorji, Tashi Dema, Bikram Chhetri, Cheku Dorji, Slamet Riyadi, Florentinus Budi Setiawan	
Contact person	Sushil Paudel	
E-mail address	sushilpaudel@kec.edu.np	
Organisation	Kantipur Engineering College	
Approval Status	Draft ☐	Final ☒
Number of pages		
Keyword list		
Recipients	Only Partners ☒	Public ☐
Method of Distribution	Email ☒	Internet ☐
Confidentiality Status	Confidential ☐	Public ☒
Copyrights		

Disclaimer

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

DOCUMENT HISTORY

VERSION NO	DATE	Approved By	Revised By
1	03/02/2023	Slamet Riyadi	Florentinus Budi Setiawan
2	07/02/2023		Manoj Sharma
3	29/03/2023		Sushil Paudel
4	16/05/2023		Sushil Paudel
5	15/9/2023		Sushil Paudel
6	16/9/2023		Dimitrios Lampridis
7	19/9/2023		Sushil Paudel
8	20/9/2023	Dimitrios Lampridis	
9	01/10/2023	Varvara Katsanou	
10	07/10/2023		Sushil Paudel
11	**15/10/2023**	**Dimitrios Lampridis**	**Varvara Katsanou**

Table of Contents

List of figures

List of tables

EXECUTIVE SUMMARY

This executive summary highlights the activities conducted by three institutions: SCU from Indonesia's Electrical and Power Engineering Study Program, RUB from Bhutan's Tracer Study of Electrical Engineering Programme, and KEC's three programs as part of D1.4.

SCU's Electrical and Power Engineering Study Program visited three companies in Sidoarjo, Pasuruan, and Denpasar. The visits to PT. Fuboru Indonesia, PT. Amarta Indah Otsuka, and eV Studio provided valuable insights into various industries related to electrical and power engineering. The team learned about production processes, environmental commitments, and career opportunities, enhancing their practical knowledge and understanding.

RUB from Bhutan conducted a Tracer Study of their Electrical Engineering Programme to assess the outcomes and impacts of the program. The study tracked the career trajectories and achievements of graduates, evaluating employment rates, job satisfaction, salary levels, and professional growth. The insights gathered will help improve the quality and relevance of the Electrical Engineering Programme.

KEC hosted three programs as part of D1.4. These programs focused firstly on the establishment, operation, and sustainability of a High Voltage Laboratory, providing insights into infrastructure, equipment selection, and safety measures. Secondly, a bilateral meeting between Pokhara University and Kantipur Engineering College aimed to foster collaboration and explore opportunities for joint research and resource sharing. Lastly, a bilateral meeting with EDIBON and YALONG Tech. was conducted to prepare specifications for the High Voltage Laboratory, leveraging the expertise of both companies. These initiatives from SCU, RUB, and KEC demonstrate their commitment to advancing electrical engineering education and industry collaborations. The visits, tracer study, and programs aimed to enhance practical knowledge, improve program outcomes, and establish state-of-the-art facilities. By leveraging industry partnerships and conducting comprehensive studies, these institutions will contribute significantly to the growth and relevance of the electrical engineering field.

Royal University of Bhutan (RUB)-CST: TRACER STUDY OF ELECTRICAL ENGINEERING PROGRAMME

1. Introduction

B.E in Electrical Engineering Programme was started in July 2001 and since then a total of 541 graduated from the programme. The total graduates comprise of 327 male graduates and 141 female graduates and almost 80% of the graduates have been gainfully employed in different organisations around the country. This tracer study report 2021 for B.E in Electrical Engineering programme is a collective summary of feedback provided by the graduates and stakeholders. This report highlights the current job opportunities for the Electrical Engineering graduates in the Bhutanese job market and through this tracer, we try to understand the relevance of the current curriculum with the policies and the technological needs that are guiding the developmental works in the country. The information from the graduates and stakeholders is critical as it provides an insight to update the curriculum of B.E in Electrical Engineering programme offered at CST as mentioned in Figure 1.

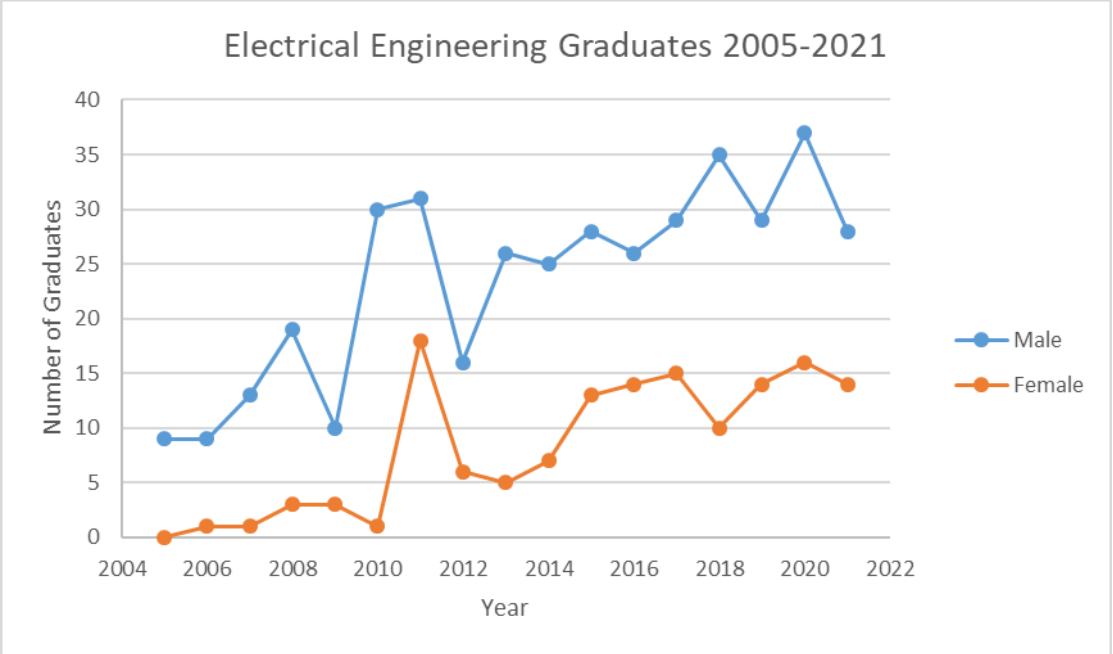


Figure 1: Electrical Engineering Graduates 2005-2021.

1.1. Objectives

The main objectives of this tracer study are:

1. To understand the demographic and socio-economic characteristics of Electrical Engineering graduates.
2. To understand the current job market scenarios
3. To evaluate the ability of our graduates to use their knowledge, skills and competencies through employment or other means.

4. To determine the stakeholder's aspirations of the EE graduates from CST
5. To find the need to improve delivery, quality, relevance and employability of EE graduates.

1.2. Methodology

This tracer study was conducted considering the employment of Electrical Engineering graduates in the different sectors in the country. The Study was conducted through the following steps:

1. By collecting feedback from the CST graduates and supervisors/employers on the relevance of the program offered at CST.
2. Stakeholder meetings at the relevant organisations considering the relevancy of the programme and employability of the graduates.

Department conducted the meetings with the power plant officials at Punatshangchu Hydroelectric Project Authority (PHPA-I) and Basochhu Hydro Power Plant (BHPP). The meetings with other stakeholder couldn't be conducted due to the lockdown restrictions from 16th January 2022. However, the feedbacks were received through the online questionnaires developed through the google form.

1.3. Sampling

There are a total of 541 graduates as of 2021 and majority of them are working in the different regions of Bhutan. The sampling was chosen to cover different domains of working environments such as policy level, administrative, professional and technical level. As per employment data basis recorded with us, the majority of the graduates are working in BPC, DGPC and Ministry of Economic Affairs, and majority of them based in Thimphu. Some graduates are working in on-going Hydro-Projects (PHPA I& II), and others are working in Power Plants (KHP, CHP & THP) and in private industries in and around Phuentsholing and Pasakha.

2. Graduate Feedback Analysis

2.1 Employment Scenario

Electrical Engineering (EE) graduates from CST has been getting the gainful employment since the first cohort of graduates starting the year 2005. In general EE graduates have worked in and outside the country. The opportunities for the EE graduates mainly lie in the areas of policy making, power generation, transmission & distribution, construction and process industries. Looking at the trends of employment over the years, the employment opportunities have been in the sectors such as civil service, corporations and the private sectors in the

country. Every year the department collects the job placement details of the EE graduates after their graduation from CST. Table 1 shows the details of the employment of the EE graduates since 2005. Since 2014, due to the more specialized nature of the jobs in the electronics, IT and communication sectors, graduates of EE have been seeing a less trends in employment in these sectors, owing to the availability of the graduates from other engineering programmes. The pandemic situation from 2020 have also affected the employment of the graduates.

YEAR	DISCIPLINE						
	ELECTRICAL Engineering						
	Male	Femal	Total	Employed	Unemployed	Employed %	Remarks
2005	9	0	9	9	0	100%	
2006	9	1	10	10	0	100%	
2007	13	1	14	14	0	100%	
2008	19	3	22	22	0	100%	
2009	10	3	13	13	0	100%	
2010	30	1	31	31	0	100%	
2011	31	18	49	49	0	100%	
2012	16	6	22	22	0	100%	
2013	26	5	31	31	0	100%	
2014	25	7	32	27	5	84%	
2015	28	13	41	32	9	78%	
2016	26	14	40	27	13	68%	
2017	29	15	44	29	15	66%	
2018	35	10	45	35	10	78%	
2019	29	14	43	21	22	49%	
2020	37	16	53	21	32	40%	
2021	28	14	42				
TOTAL	372	141	541	393	106		

Table 1: Employment of EE graduates (2005-2021).

2.2 Tracer study respondents

Tracer study for graduates was conducted through the development of the questionnaire using the google form and circulated to the different cohort of the graduates. A total of 98 responses have been received and 70% of the responders are from the 2017-2021 cohort. The information from this cohort is particularly important as the last review from the programme was conducted in December 2016 and the implementation of the reviewed programme was from the year 2017. The current employment details of the respondent graduates are given in Table 2.

Employment Type	No.
Employed and working full time	82
Unemployed	12

Employed and on further study	2
Contract Employed	1
Self Employed	1
Total	**98**

Table 2: Respondents Details.

In the above table, currently around 33% of the unemployed responders are doing their advanced or master's study in different countries. Their feedback is particularly important to evaluate the current relevancy of the B.E EE programme in line with international standards.

The majority of the graduates who are employed and responded to this tracer study are working in the areas of power generation, transmission & distribution system, government institutions and the construction industries. The study among them also found that around 71.8% of them have got their jobs within six months of their graduation and 20% within one year after the graduation as depicted in Figure 2.

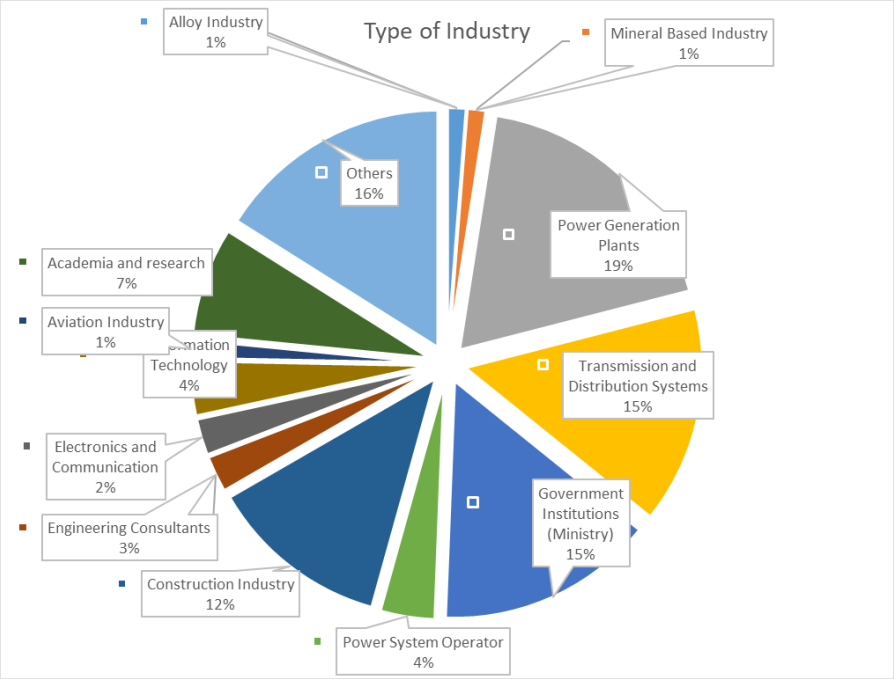


Figure 2: Responders current sector of work.

In the nature of responsibilities, it has been found that the majority of the EE graduates are required to deal with technical and administrative works. 10.2 % of the surveyed upgraded their qualifications to masters' level and 4.1% are currently undergoing their qualification upgradation outside the country. Department is also aware of 1 completing the PhD and 2 undergoing their PhD in the universities in Japan and United Kingdom respectively.

2.3 Experience of the graduates regarding B.E in EE programme at CST

Graduates were surveyed on their experience with the B.E in EE programme at CST in the areas of teaching and learning and their relevance to their work applications. Graduates were

asked to rate their experience on a scale of 5. The overall responses of the graduates to the different indicators concerning the objectives, module relevancy, quality of teaching of the programme has been generally found to be adequate. Figure 3 & Table 3 provide the complete details of the assessment. This survey also finds that about 83.7% of the graduates recommend others to join CST for their studies in B.E in Electrical Engineering programme.

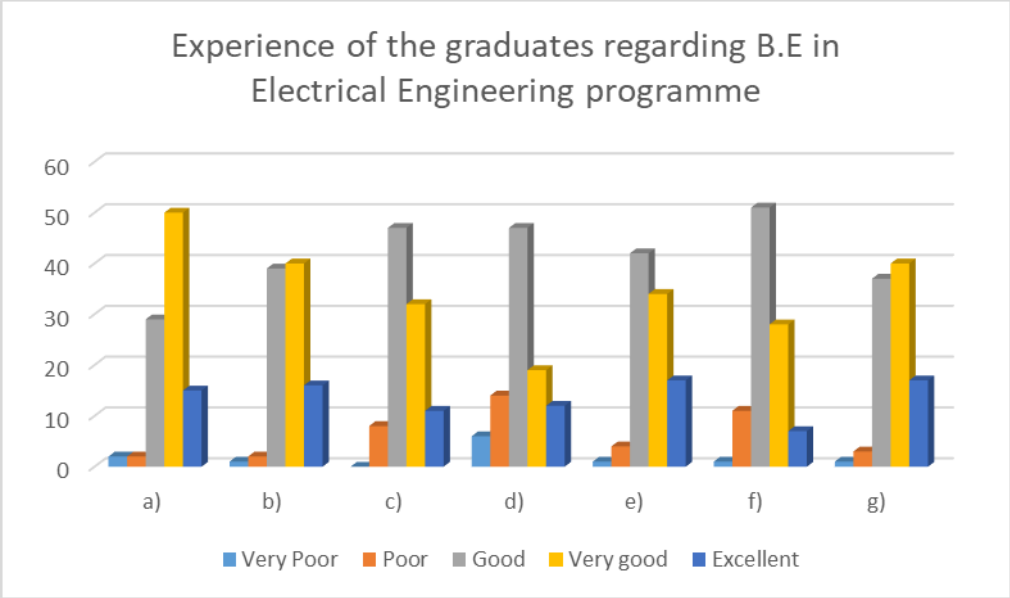


Figure 3: Graduates experience in EE programme.

Experience of the graduates regarding B.E in Electrical Engineering programme.	**1**	**2**	**3**	**4**	**5**	**Weighted Average**	**Remark**
a) Overall Experience in College of Science and Technology	2	2	29	50	15	3.75	**Good**
b) The overall aims and objectives of my courses in B.E in Electrical Engineering were clear.	1	2	39	40	16	3.69	**Good**
c) The modules taught at CST are relevant and applicable to my work	0	8	47	32	11	3.40	**Good**
d) The practicals conducted at CST are relevant and applicable to my work	6	14	47	19	12	3.17	**Good**
e) The teaching faculties were helpful beyond lecture hours.	1	4	42	34	17	3.63	**Good**
f) The quality of teaching in the modules were generally good	1	11	51	28	7	3.29	**Good**

g) Overall, I enjoyed my course.	1	3	37	40	17	3.70	**Good**

Table 3: Graduates experience in EE programme.

2.4 Knowledge and Development

The response to knowledge and development is shown in Figure 4 and Table 4 by the graduates. The respondents' conceptual and analytical skills have been greatly enhanced by the program they have pursued at CST. The Majority of the respondents agree that the course has enhanced the ability to plan and work independently and the program did provide opportunity to enhance their ICT knowledge.

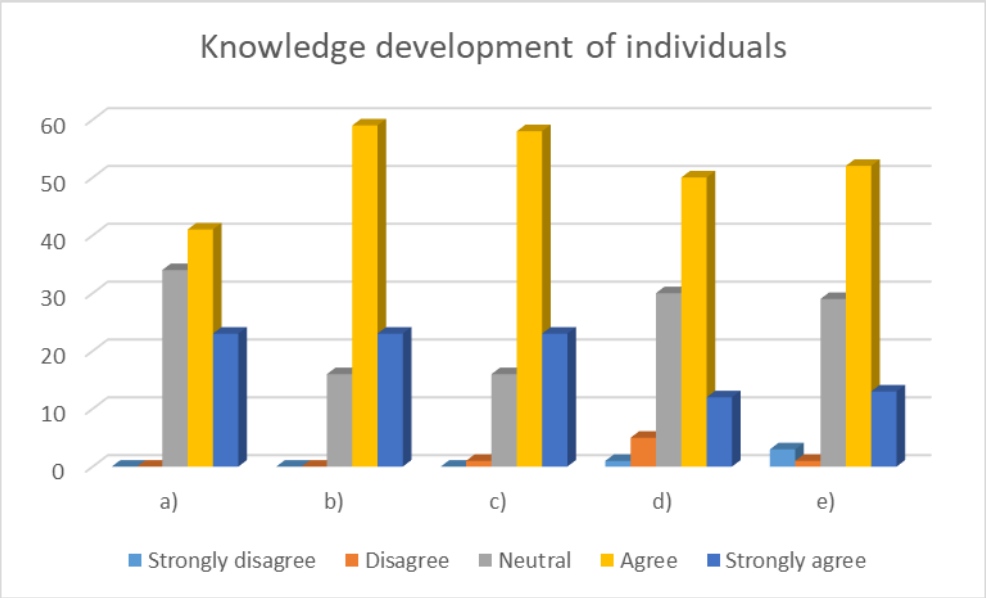


Figure 4: Knowledge developments of EE graduates.

Knowledge and development of the individuals after their completion of B.E in Electrical Engineering programme	**1**	**2**	**3**	**4**	**5**	**Weighted Average**	**Remark**
a) The course has changed me as a person in significant ways.	0	0	34	41	23	3.88	**Neutral/ Good**
b) The course has enhanced my conceptual and analytical skills.	0	0	16	59	23	4.07	**Agree/ Very good**
c) The course has enhanced the ability to plan and work independently.	0	1	16	58	23	4.05	**Agree/ Very good**
d) The course has enhanced the ability to use required software and Information Technology	1	5	30	50	12	3.68	**Neutral/ Good**

	effectively.							
e)	The course has enhanced my management skills.	3	1	29	52	13	3.72	**Neutral/ Good**

Table 4: Knowledge development of EE graduates.

Apart from the above individual knowledge and development, students have also listed the following competencies as given in Figure 5, which they developed while here at CST.

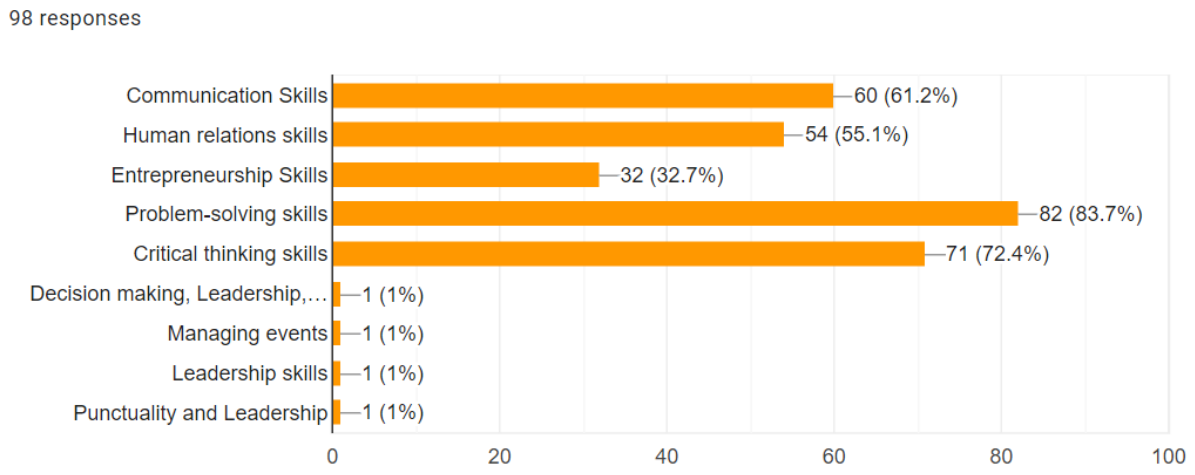


Figure 5: Graduates' competencies.

2.5 Facilities and resources

EED has always strived to develop adequate learning facilities in the department and since 2016 there has been adequate addition of laboratory and learning facilities especially in the areas of renewable energy technologies. Department has been able to develop the Solar PV, Solar thermal systems, and wind power simulators laboratory. The Department has also developed around 30 kW of Solar Photovoltaic systems, 400 liters of solar water heating system used for in campus power generation and usage. As the country moves in the introduction of the electric vehicle in the transportation sector, the department has also successfully designed and fabricated a battery powered electric vehicle. All of the above developed facilities are currently being used as teaching and learning facilities. Graduates feedback to the survey on the facilities and resources is being shown through Figures 6 & 7 as well as through Tables 5 & 6. In general, students responded that the overall adequacy of the facilities and resources has been provided well for the programme. It has been also found that the industrial tours and the On-The-Job Training (OJT) programmes were useful and have enhanced student's learning. Students carried out their OJT mostly in the sectors such as hydro power plants (DGPC, PHPA-I &II, MHPA etc.), transmission & distribution (BPC) and process industries (Pasakha) around the country. The Majority (66.3%) of the students have also recommended that the OJT duration be increased from current 45 days to 90 days, while 21.4% have responded as No and 12.2% as may be.

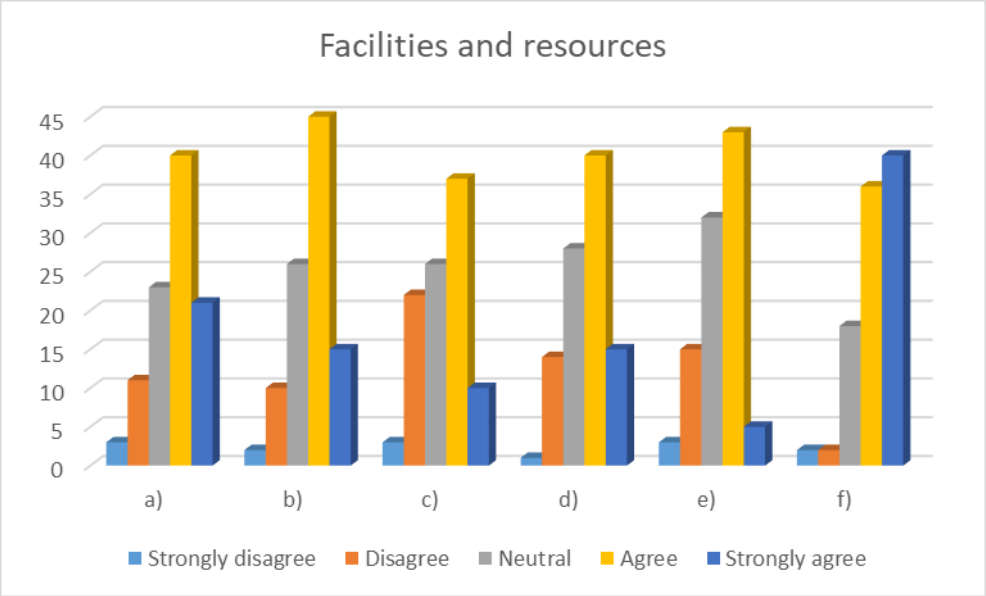


Figure 6: Facilities and resources (a-f).

	1	2	3	4	5	Weighted Average	Remark
a) There were adequate reference books available in the library	3	11	23	40	21	3.66	Neutral/ Good
b) The IT facilities were adequate	2	10	26	45	15	3.62	Neutral/ Good
c) Hostel facilities were up to my expectations	3	22	26	37	10	3.29	Neutral/ Good
d) College provided enough recreational facilities	1	14	28	40	15	3.55	Neutral/ Good
e) The laboratory facilities were adequate	3	15	32	43	5	3.32	Neutral/ Good
f) The industrial tours were useful and enhanced my learning	2	2	18	36	40	4.12	Agree/ Very Good

Table 5: Facilities and resources (a-f).

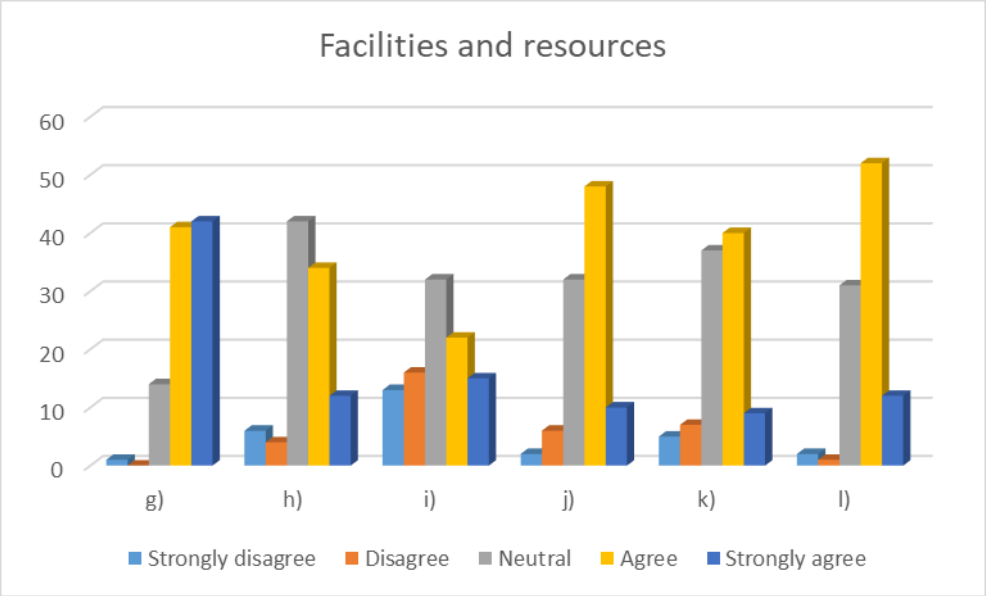


Figure 7: Facilities and resources (g-l).

	1	2	3	4	5	Weighted Average	Remark
g) The OJT were useful and enhanced my learning	1	0	14	41	42	4.25	Agree/ Very Good
h) The guest lectures were useful and enhanced my learning	6	4	42	34	12	3.42	Neutral/ Good
i) I had to take additional skills training after my degree to make myself suitable for jobs?	13	16	32	22	15	3.10	Neutral/ Good
j) The administrative staff were very helpful	2	6	32	48	10	3.59	Neutral/ Good
k) journals, software, labs etc. were adequate.	5	7	37	40	9	3.41	Neutral/ Good
l) Overall, I am satisfied with the facilities and resources provided at CST.	2	1	31	52	12	3.72	Neutral/ Good

Table 6: Facilities and resources (g-l).

2.6 Graduates' plans to upgrade qualification

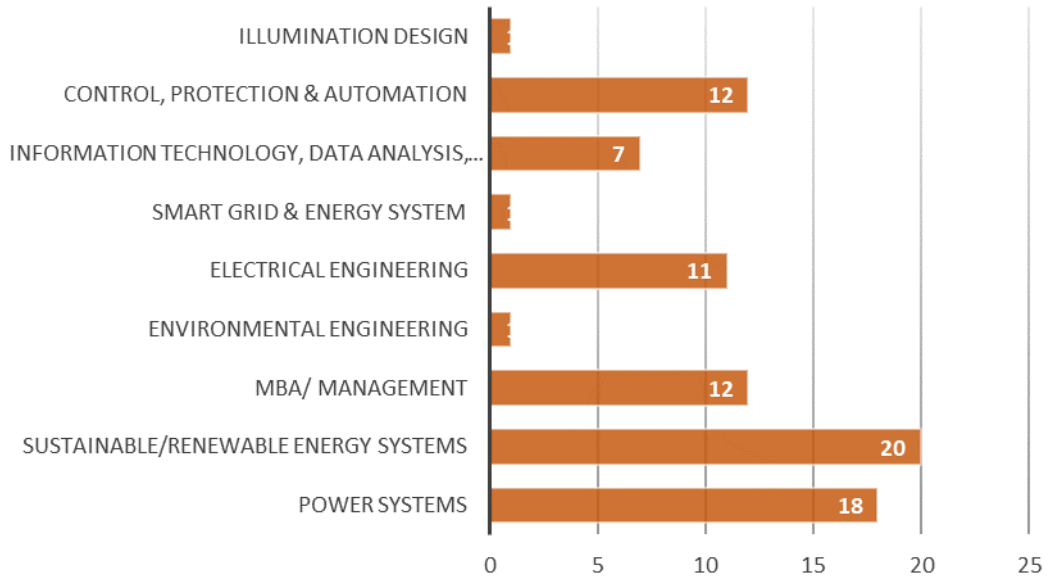


Figure 8: Graduates plans for qualification upgradation.

Figure 8 gives the details of the graduates plans to upgrade qualifications. It is being seen that the majority of the graduates are interested in upgrading their qualification in the areas of sustainable and renewable energy systems, and then followed by Masters in Power Systems.

2.7 Graduates' feedback on theoretical, practical and elective modules

Specific theoretical subjects taught at under B.E Electrical Engineering programme that needs modification/ improvements to suit Graduates' work are given in Table 7.

Module	**Specific changes required**	**Total response**
Engineering economics	Irrelevant (?????)	1
Power Electronics	Include Industrial visits	2
Power Systems Analysis	Include Industrial visits, software based simulations, in-depth topics on power system analysis during faults and effect on switchgear equipments.	13
Electrical Machine	Include Machine Design topics & Industrial visits	7
Instrumentation Engineering	Include Industrial visits	2
Switchgear & Protection	Include Industrial visits, Include related softwares & Practical	3
Control System	Include relevant software, sensors, timer based street lightings control systems.	3

Hydraulics & Hydraulics Machines		1
Signals & Systems	Not relevant	3
Electrical Workshop Practice	Make practical sound skills	2
Electronics		2
Electromagnetic Field Theory	Irrelevant	2
Electrical Installation Design	Include illumination design, costing and estimation, more focus required as graduates can work as freelance	5
Introduction to Programming	Include JAVA and Python	2
High Voltage Engineering		3
Communication Engineering	Include industrial data network and communication protocols	1
Project Management		1
Entrepreneurship		1

Table 7: Graduates feedback on theoretical, practical and elective modules.

Graduates have also suggested the specific modules or the unit/topics that could be introduced in the Electrical Engineering programme. Details are given in Table 8.

1. Automation, design and planning
2. Power system Optimization and FACT
3. Introduction to Power electronic convertors for the renewable energy integration and Engineering economics
4. lighting design
5. Protection relay testing and analysis in addition to/under Switchgears and protection
6. Emphasize more on programing and software, give more focus on System Protection and Control Systems and introduction to Machine Design and Simulation software (esp. Generator and Transformers)
7. Full course on design of power system network
8. Power system optimization
9. Energy audit
10. AutoCAD and other 3D sketch up need to be taught in depth
11. Separate module on Hydropower generation and distribution. Mostly in relation with Bhutan.
12. Transmission and distribution system pertaining our country.
13. SCADA, PLC programming
14. Electrical AutoCAD design and HVAC
15. Smart Grid and Electrical Installation and Erection (be it transmission or distribution)
16. Renewable energy course (solar in depth)
17. Industrial control circuit, practical on VCB, VFD, PLC, SCADA etc.

18. modules containing 3-D electrical simulations, Solar power plant simulations.
19. Hydropower Engineering
20. Basic software knowledge like dialux and ETAP, JAVA and Python
21. Modules that solely focuses on practical scenes (HVAC, UPS, Diesel Generator, Transformers, Solar panels, SCADA system)- Design, Installation, Configuration.
22. HVDC Technology and Short Circuit Contribution of HVDC Light, Geothermal Power Stations, Supervisory control and data acquisition (SCADA systems in power stations), Flexible AC Transmission System, Programming and simulation of software related to electrical like DIgSILENT Power Factory, Matlab, Etab, Dialux software
23. Design drawings, cost estimation, rate analysis of electrification works as a compulsory module not as a selective module. Also, if new modules like renewable energy in context with Bhutan related issue, how to make use of this kind of energy like solar energy and with Field visits.
24. Basics to Python Coding
25. Energy storage systems
26. Basic Economics & Statistics. Renewable Energy Technology (solar, wind, hydrogen). Grid integration etc.
27. Data Science and AI
28. Design of Renewable Energy (solar, wind, etc)
29. Artificial intelligence
30. Renewable energy and energy efficiency
31. Industrial engineering, automation, renewable, energy efficiency and design

Table 8: Topics/units to include in modules.

2.7.1 Practical that need modifications/improvements

Graduates have responded that all the practical work under EED need to be modified and improved with the changes in the technology. Some of the new topics suggested for the laboratory works are:

1. Introduce computer simulation for Control and Protection System
2. Practicals with solar, wind and hydropower plant
3. UPS, HVAC, Fire alarm system, large scale sound system set up, CCTV installation set up etc.
4. Software such as ETAB for load flow analysis.
5. VFD and VVVF Technology
6. Power Analyzer and Earth fault tests.

2.7.2 Electives modules in Electrical Engineering programme

About 65% of graduates undertaking the survey have informed that the elective module that they have taken during their study us relevant to their job and was practically useful and easy to apply. Some of the recommendations from the graduates to include new elective modules and topics are:

1. Power System optimization
2. Electrical Installation and Design

3. Project Management with construction manager software
4. Machine Learning with MATLAB
5. DSP Programming
6. Energy Auditing
7. Basic Aviation Theory and System
8. Human Resource Management
9. HVAC systems and design
10. Renewable Energy Technologies
11. Electric Vehicle Design
12. Numerical relays
13. Bhutan Power System (the module should contain all policies, details on generation, transmission and distribution and the technology applied in Bhutan)
14. Industrial control system
15. Installation Maintenance & Testing of Electrical Equipment, Industrial Automation
16. Power policy and Regulations and Power Economics
17. Networking, Storage/Database and Mode of communication/communication protocol as Electrical Engineers are often assigned to look after server related works.
18. Substation Design
19. SCADA and Automation
20. Smart home and automation
21. Contract, tender and management
22. Design of Electrical Distribution System and its transient studies
23. Data Analysis

3. Stakeholder Survey Results

3.1 Type of Organization

The stakeholder survey for review of BE in Electrical Engineering programme saw 33 respondents from various sectors in Bhutan. More than 60% of the respondents were from corporation which mainly consists of respondents from BPC and DGPC, followed by 14.71 % from Government Institutions (Figure 9). More than 52% of the respondents have more than 100 employees working for the organization (Figure 10).

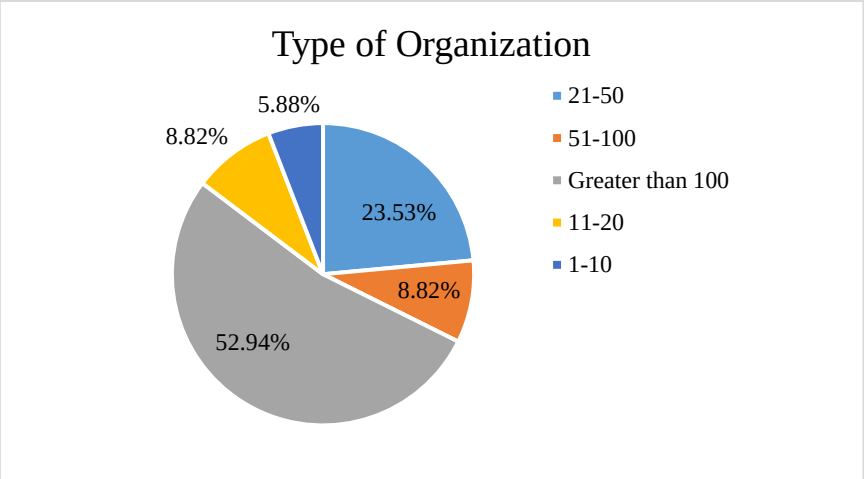


Figure 9: Type of Organisations

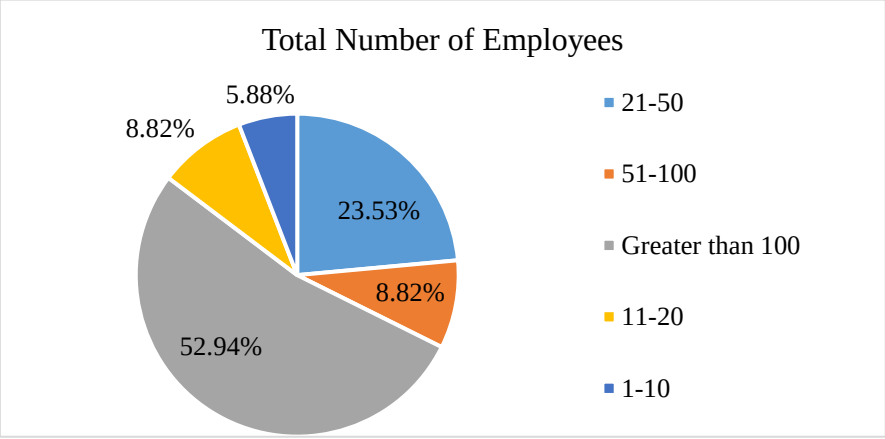


Figure 10: Total number of employees.

3.2 Feedback of Experience of Employers with Graduates

Respondents were asked to rate the experience of employers working with electrical engineering graduates. The purpose of this question is to collect information regarding employee satisfaction regarding knowledge, social skills and communication skills. Generally, the employers rated the graduates very good to excellent with more than 64 % rating very good and more than 21% rating excellent.

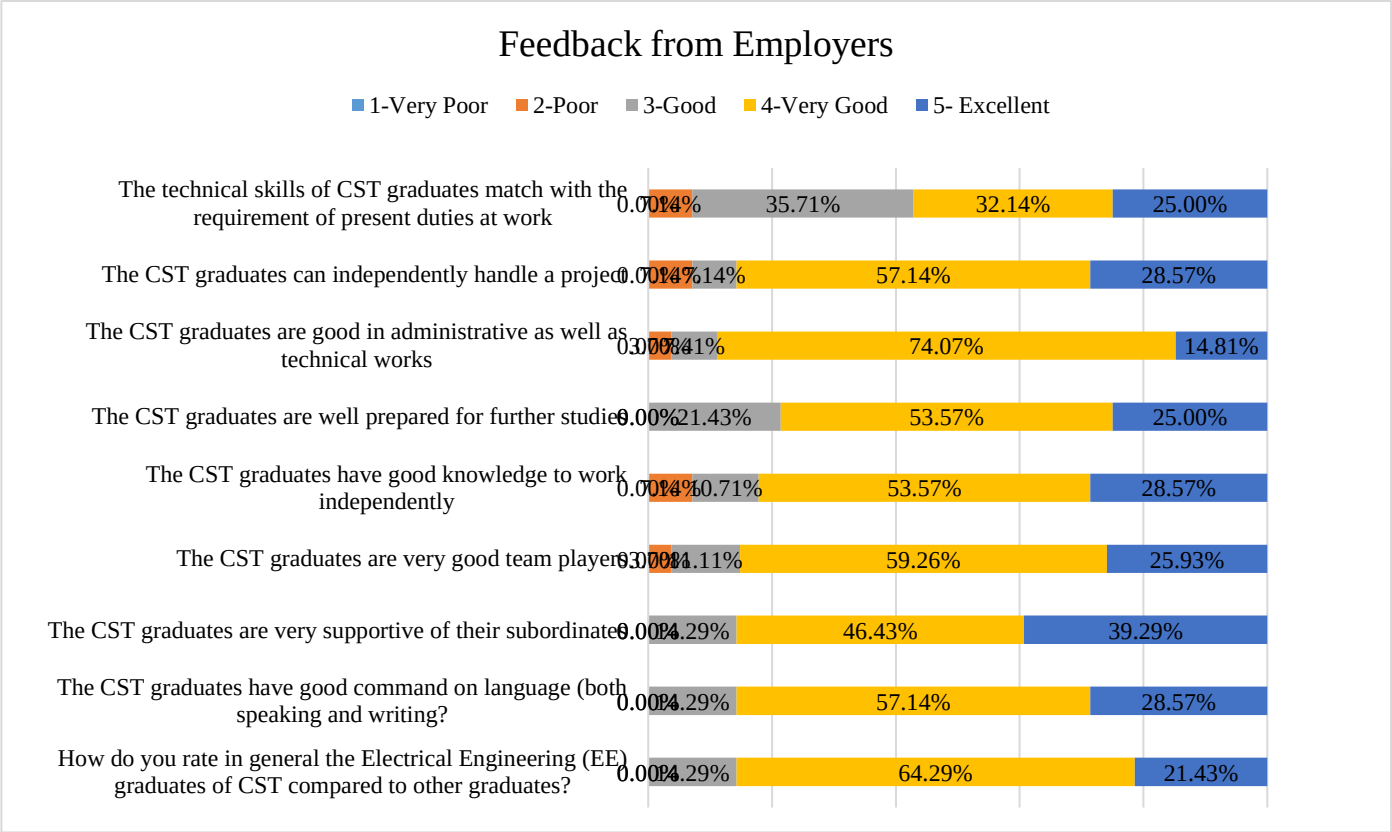


Figure 11: Feedback from employers/supervisors.

From the stakeholder survey it was noted that the graduates had reasonably good command over the language both in written and speaking with 57% rating very good and more than 28 % rating excellent. The graduates have been found to be a good team player with more than 59% rating very good and more than 25% rating excellent which is being conferred by their willingness to support their subordinates with more than 80% agreeing that graduates are supportive to their subordinates. The traits like working independently, being prepared for skills upgradation and understanding administrative works were all rated above 70% by the respondents. The analysis on whether the graduates had adequate technical skills was rated 35% good, 32% very good and only 25% as excellent (Figure 11). Overall employers opined that graduate had required technical, administrative, social and communication skills.

The results from the graduate feedback from employer satisfaction showed that there is a room for improvement in terms of imparting technical skills which are required in the current field of work, the high percentage (35.71%) of respondents rated good under this category. The weighted average analysis shows that employers rated graduates to be very good (Table 9).

Feedback on overall experience of employers with CST Graduates	**1-Very Poor**	**2-Poor**	**3-Good**	**4-Very Good**	**5-Excellent**	**Weighted Average**	**Remarks**

How do you rate in general the Electrical Engineering (EE) graduates of CST compared to other graduates?	0	0	4	18	6	4.071429	**Very Good**
The CST graduates have good command on language (both speaking and writing?	0	0	4	16	8	4.142857	**Very Good**
The CST graduates are very supportive of their subordinates	0	0	4	13	11	4.25	**Very Good**
The CST graduates are very good team players	0	1	3	16	7	3.928571	**Very Good**
The CST graduates have good knowledge to work independently	0	2	3	15	8	4.035714	**Very Good**
The CST graduates are well prepared for further studies	0	0	6	15	7	4.035714	**Very Good**
The CST graduates are good in administrative as well as technical works	0	1	2	20	4	3.857143	**Very Good**
The CST graduates can independently handle a project	0	2	2	16	8	4.071429	**Very Good**
The technical skills of CST graduates match with the requirement of present duties at work	0	2	10	9	7	3.75	**Very Good**

Table 9: Weighted average on feedback of employers.

Employers were asked to suggest possible topics to be included in the programme to enhance and to keep abreast with the changes taking place in the field. Some of the suggested topics are listed below:

- *Control and Protection Systems*
- *Relay Testing Engineering*
- *Maintenance of power system infrastructures*
- *Renewable Energy, Integration of RE, Green Hydrogen*
- *Automation and SCADA*
- *Power System Stability Analysis*
- *Power Reliability and Market Analysis*
- *AI and Machine Learning in Power System*

3.3 Employers' feedback on Knowledge on important Electrical subjects

The stakeholders were asked to rate the fundamental knowledge of the graduates on electrical subjects and the stakeholders rated the fundamental knowledge of students to be very good. The subject areas like Control Systems, Power Electronics and Instrumentation have been rated slightly lower than other modules.

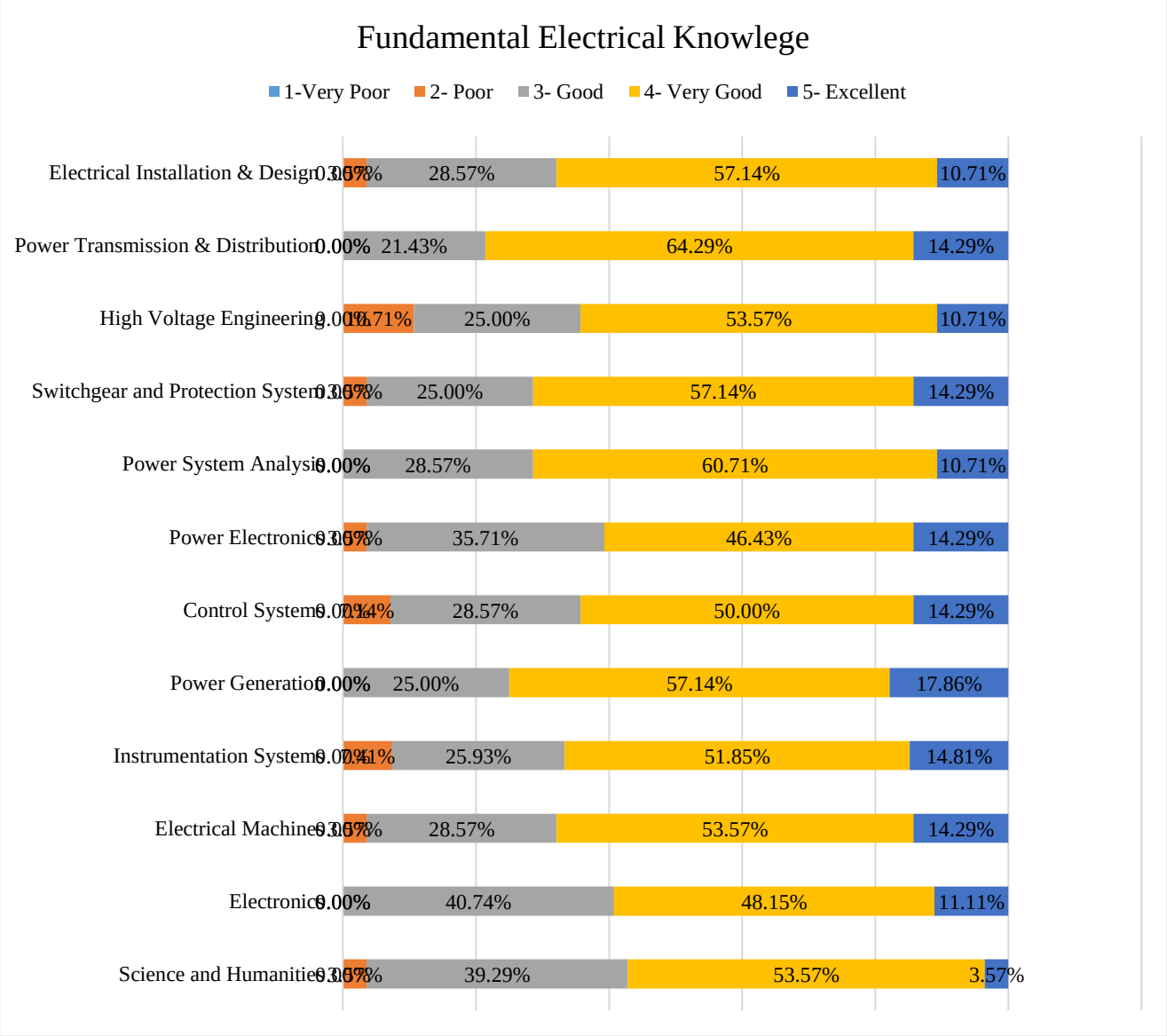


Figure 12: Feedback on fundamental subject knowledge.

	1-Very Poor	2- Poor	3- Good	4- Very Good	5- Excellent	Weighted Average	Remarks
Science and Humanities	0	1	11	15	1	3.571429	**Very Good**
Electronics	0	0	11	13	3	3.571429	**Very Good**
Electrical Machines	0	1	8	15	4	3.785714	**Very Good**
Instrumentation Systems	0	2	7	14	4	3.607143	**Very Good**
Power Generation	0	0	7	16	5	3.928571	**Very Good**

Control Systems	0	2	8	14	4	3.714286	**Very Good**
Power Electronics	0	1	10	13	4	3.714286	**Very Good**
Power System Analysis	0	0	8	17	3	3.821429	**Very Good**
Switchgear and Protection System	0	1	7	16	4	3.821429	**Very Good**
High Voltage Engineering	0	3	7	15	3	3.642857	**Very Good**
Power Transmission & Distribution	0	0	6	18	4	3.928571	**Very Good**
Electrical Installation & Design	0	1	8	16	3	3.75	**Very Good**

Table 10: Weighted average of fundamental subject knowledge.

Table 10 represents Weighted average of fundamental subject knowledge.

Generally, the respondents opined that the programme covers most fundamentals of electrical engineering and the programme team may review the contents of the module to suit the need of the current market. Stakeholders were asked on the new technology that has been introduced to understand the technologies being using in the field, the following are some of the technologies mentioned:

- *Automation and SCADA*
- *Numerical Relays*
- *Integration of Renewable Energy*
- *Offline Fault Location*
- *Renewable Energy and Hydrogen Fuel Cells*

3.4 Employers Feedback on Graduate Attitude and Behaviour

The respondents were asked to rate the graduate's attitude and behaviour with the traits like Activeness, hard work, cooperation, punctuality, creativeness, willingness to learn and so on. The graduates were found to be generally very good with social and interpersonal communication skills. The traits like communication skills, creativeness and being organized was rated about 30%, which can be improved by introducing suitable programs where students are able to improve those skills. It is evident from the analysis that graduates were found to be punctual and hardworking, honest and ambitious (Figure 13).

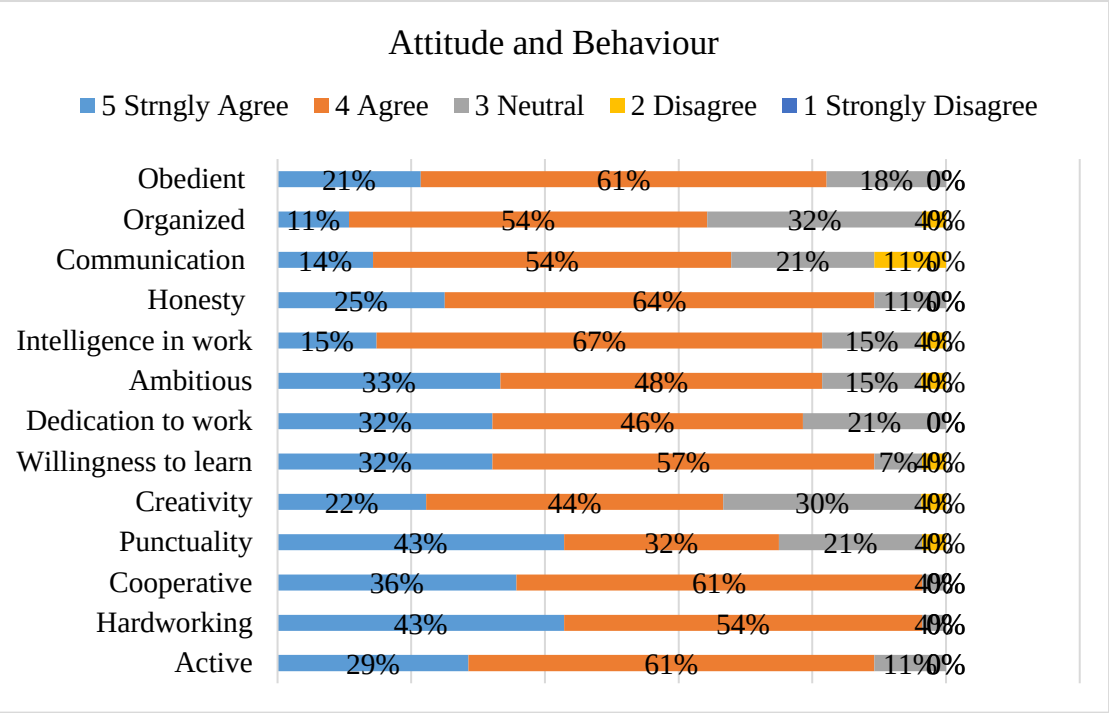


Figure 13: Attitude and behavior of graduates.

Table 11 represents the Weighted average of attitude and behavior of graduates.

Rating of CST graduates done by the employers in terms of attitude and behavior	**5 Strongly Agree**	**4 Agree**	**3 Neutral**	**2 Disagree**	**1 Strongly Disagree**	**Weighted Average**	**Remarks**
Active	8	17	3	0	0	4.178571	**Very Good**
Hardworking	12	15	1	0	0	4.392857	**Very Good**
Cooperative	10	17	1	0	0	4.321429	**Very Good**
Punctuality	12	9	6	1	0	4.142857	**Very Good**
Creativity	6	12	8	1	0	3.714286	**Very Good**
Willingness to learn	9	16	2	1	0	4.178571	**Very Good**
Dedication to work	9	13	6	0	0	4.107143	**Very Good**
Ambitious	9	13	4	1	0	3.964286	**Very Good**
Intelligence in work	4	18	4	1	0	3.785714	**Very Good**
Honesty	7	18	3	0	0	4.142857	**Very Good**

Communication	4	15	6	3	0	3.714286	**Very Good**
Organized	3	15	9	1	0	3.714286	**Very Good**
Obedient	6	17	5	0	0	4.035714	**Very Good**

Table 11: Weighted average of attitude and behavior of graduates.

3.5 Employers Feedback on Recruitment Criteria

The analysis on the important aspects of the graduates for employment shows that the graduates should have studied specialized subjects, field of study should be relevant, practical experience during the study period, and candidates view of engineering applications were rated to be most important aspects. The reputation of the department, recommendations, experience abroad and final examinations were marked to be not so much important in terms of recruitment. Therefore, the employers are looking for graduates with sound technical knowledge, team player, with good attitude and behaviour. This correlates with the findings described for employers' feedback on graduate attitude and behaviour in Figure 14.

It can be concluded that the programme should now focus on specialization with different focus fields with electives rather than offering common electives. In the near future stakeholders are looking for specialized professionals and jobs will be available for that field.

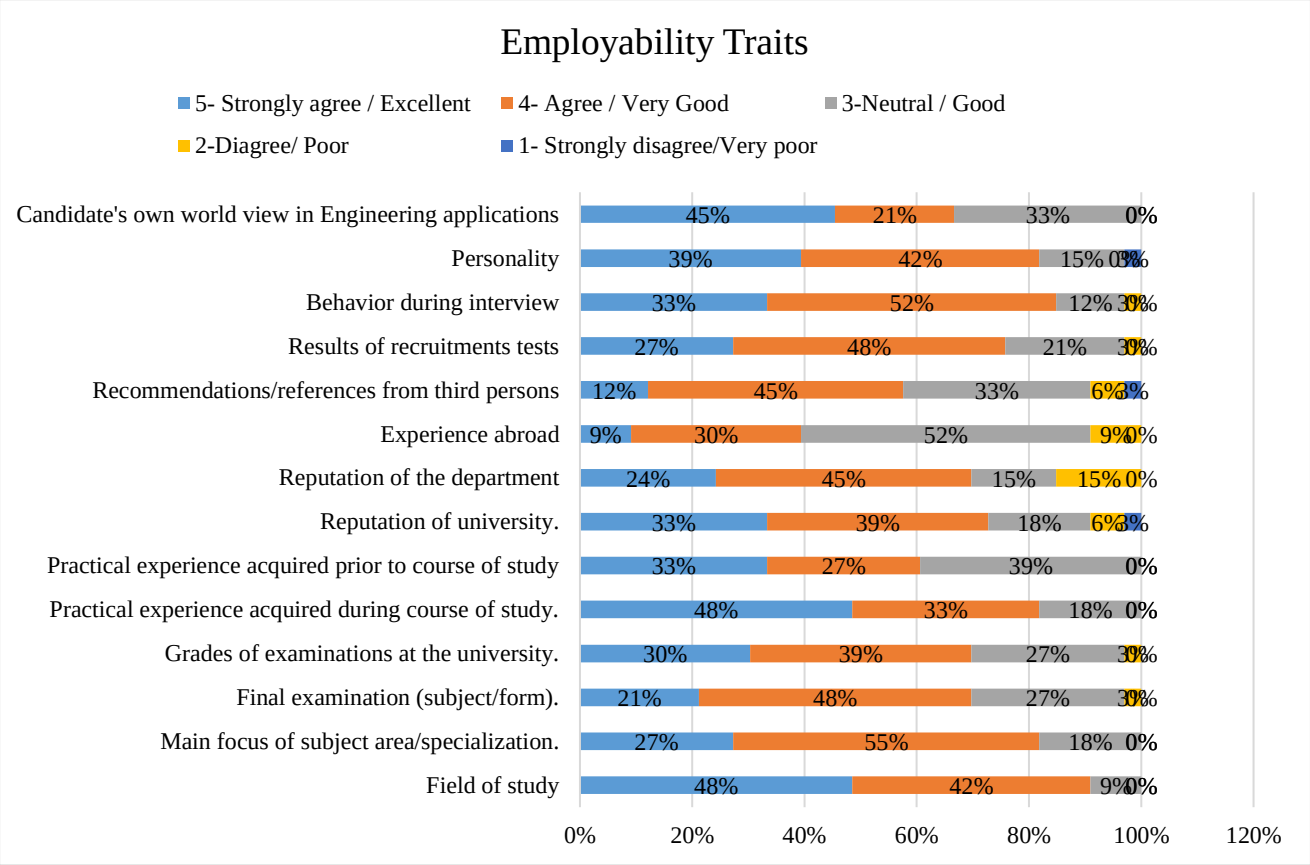


Figure 14: Employability traits.

Table 12 represents the Weighted average on employability traits.

How important in general are the following aspects for the recruitment of Electrical Engineering graduates?	**5- Strongly agree**	**4- Agree**	**3- Neutral**	**2- Diagree**	**1- Strongly disagree**	**Weighted Average**	**Remarks**
Field of study	16	14	3	0	0	4.393939	**Very Imp.**
Main focus of subject area/specialization.	9	18	6	0	0	4.090909	**Very Imp.**
Final examination (subject/form).	7	16	9	1	0	3.878788	**Very Imp.**
Grades of examinations at the university.	10	13	9	1	0	3.969697	**Very Imp.**
Practical experience acquired during course of study.	16	11	6	0	0	4.30303	**Very Imp.**
Practical experience acquired prior to course of study	11	9	13	0	0	3.939394	**Very Imp.**
Reputation of university.	11	13	6	2	1	3.939394	**Very Imp.**
Reputation of the department	8	15	5	5	0	3.787879	**Very Imp.**
Experience abroad	3	10	17	3	0	3.393939	**Very Imp.**
Recommendations/references from third persons	4	15	11	2	1	3.575758	**Very Imp.**
Results of recruitments tests	9	16	7	1	0	4	**Very Imp.**
Behavior during interview	11	17	4	1	0	4.151515	**Very Imp.**
Personality	13	14	5	0	1	4.151515	**Very Imp.**
Candidate's own world view in Engineering applications	15	7	11	0	0	4.121212	**Very Imp.**

Table 12: Weighted average on employability traits.

3.6 Requirements and Competencies

3.6.1 Fundamental Knowledge of Natural Science

The requirement and competency of natural science showed that Information and Data Analytics, Physics and Mathematics were found to be more relevant than Chemistry and Environmental Science.

The program team needs to look into contents of Chemistry and Environmental Science to suit the align the module towards the demand of the market or replace with some other relevant modules.

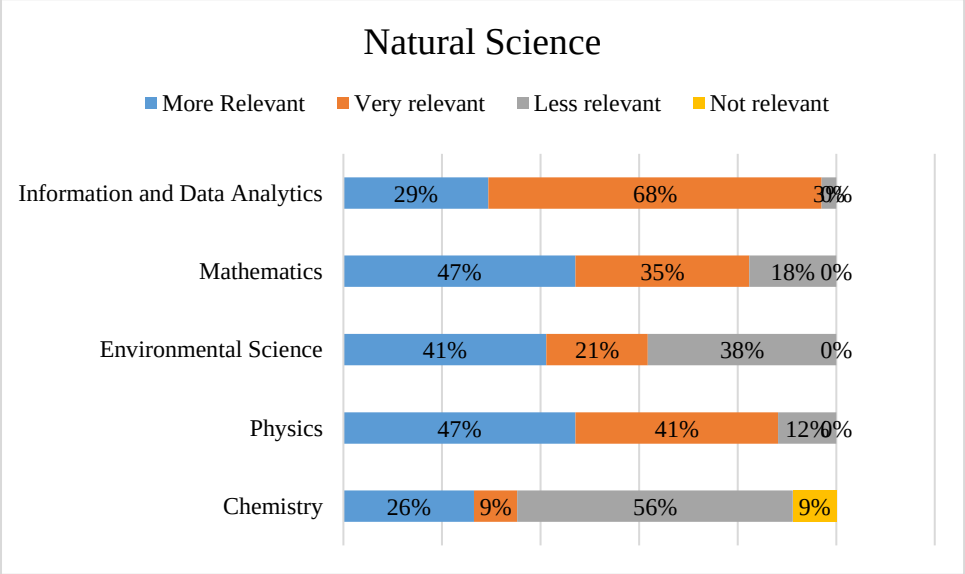


Figure 15: Relevancy of fundamental knowledge on natural science.

Table 13 represents the Weighted average fundamental knowledge on natural science.

Fundamental knowledge in natural science	**More Relevant**	**Very relevant**	**Less relevant**	**Not relevant**	**Weighted Average**	**Remarks**
Chemistry	9	3	19	3	2.529412	Very Relevant
Physics	16	14	4	0	3.352941	More Relevant
Environmental Science	14	7	13	0	3.029412	Very Relevant
Mathematics	16	12	6	0	3.294118	Very Relevant
Information and Data Analytics	10	23	1	0	3.264706	More Relevant

Table 13: Weighted average fundamental knowledge on natural science.

3.6.2 Fundamental Technical Knowledge

The respondents were asked to rate the relevancy or the importance of the fundamental technical knowledge. The respondents generally believe that all the aspects mentioned in the survey are very important. The weighted analysis shows that Power System related modules and instrumentation systems were found to be more relevant.

From the survey (as mentioned in Figure 16) inference could be drawn that stakeholders are looking for graduates with sound technical knowledge on fundamentals of core electrical engineering modules.

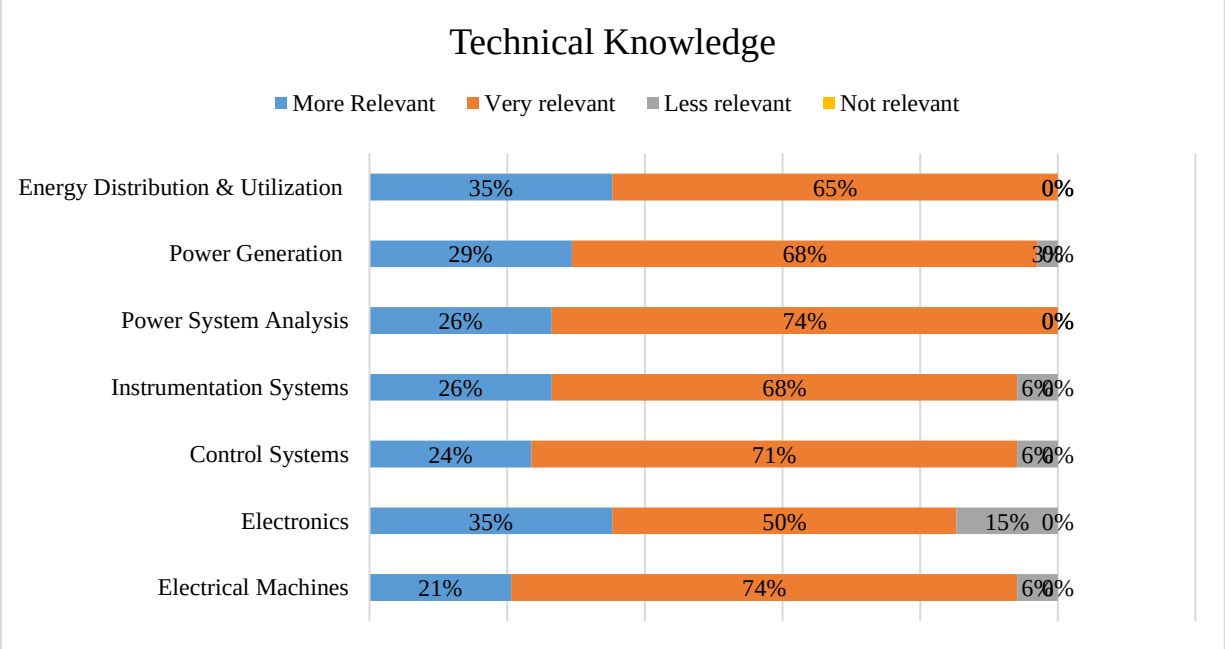


Figure 16: Fundamental technical knowledge.

Table 14 represents the Weighted average fundamental technical knowledge.

Fundamental technical knowledge	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Electrical Machines	7	25	2	0	3.147059	Very Relevant
Electronics	12	17	5	0	3.205882	Very Relevant
Control Systems	8	24	2	0	3.176471	Very Relevant
Instrumentation Systems	9	23	2	0	3.205882	Very Relevant
Power System Analysis	9	25	0	0	3.264706	More Relevant
Power Generation	10	23	1	0	3.264706	More Relevant
Energy Distribution & Utilization	12	22	0	0	3.352941	More Relevant

Table 14: Weighted average of fundamental technical knowledge.

3.6.3 Applied Technical Knowledge

The applied technical knowledge question comprised of four application areas: renewable energy systems, power system analysis and reliability, FACTS in power system and

Automation and Smart Technologies. The weighted analysis shows that the renewable energy systems and power system analysis and reliability were found to be more relevant but generally all the applied fields mentioned were marked as very relevant from the Figure 17 pictured below.

It can be concluded that there is a need for graduates to be specialized in these areas to address the resource gap and skills gap which are currently present in the job market.

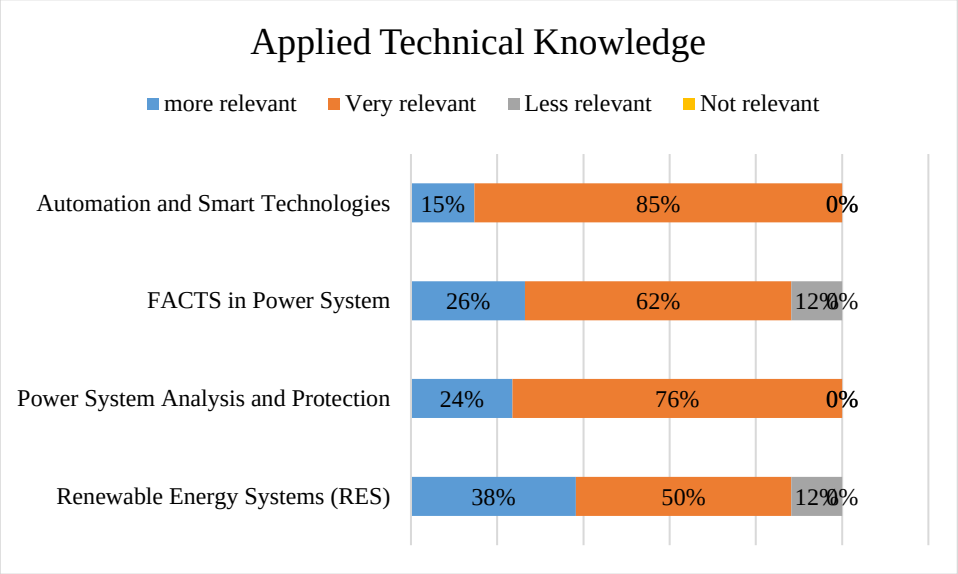


Figure 17: Applied Technical Knowledge.

Table 15 represents the Weighted average on applied technical knowledge.

Applied technical knowledge	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Renewable Energy Systems (RES)	13	17	4	0	3.264706	More Relevant
Power System Analysis and Protection	8	26	0	0	3.235294	More Relevant
FACTS in Power System	9	21	4	0	3.147059	Very Relevant
Automation and Smart Technologies	5	29	0	0	3.147059	Very Relevant

Table 15: Weighted average on applied technical knowledge.

3.6.4 Knowledge on System Management

Figure 18 below presents the result of 'Knowledge on system management'. The requirement of knowledge on system management was asked and respondents opined that facility management and environment management to be more relevant. The findings on the environment management do= not confer with that of the fundamental natural science

described in Figure 5 where environmental science was marked as less relevant with 35%. Therefore, this survey is not able to draw conclusions regarding environmental science.

However, the survey corelates positively with the importance and relevancy of power system management, operation and maintenance and facility management with Figure 6 where fundamental technical knowledge and Figure 7 Applied technical knowledge requirements are described.

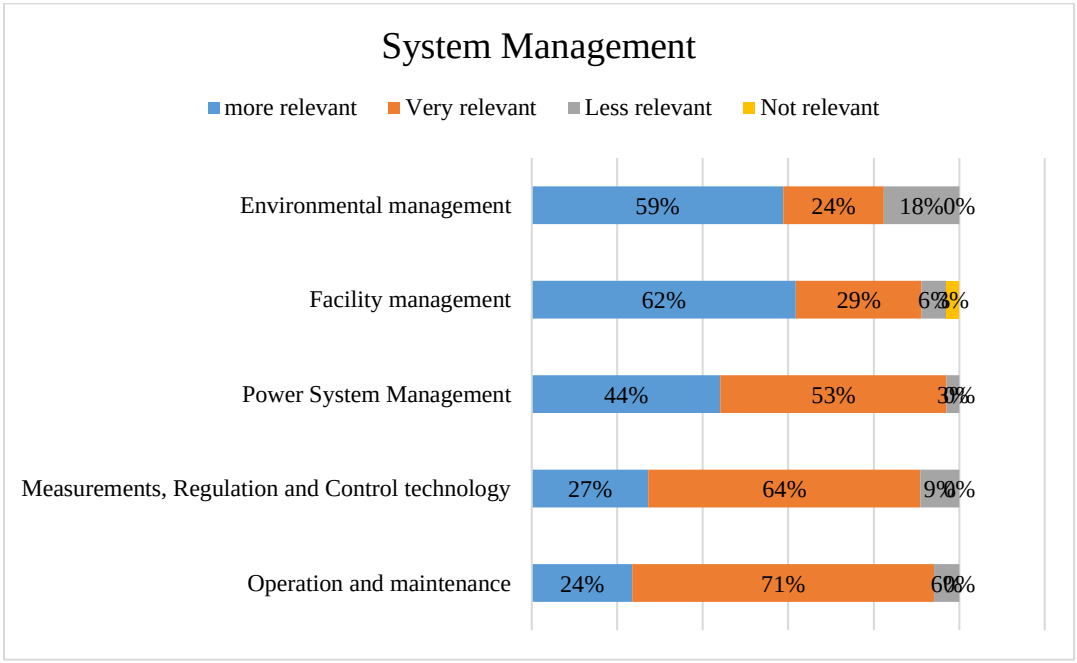


Figure 18: Knowledge on system management.

Table 16 represents the Weighted average on system management.

Knowledge in system management	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Operation and maintenance	8	24	2	0	3.176471	Very Relevant
Measurements, Regulation and Control technology	9	21	3	0	3.181818	Very Relevant
Power System Management	15	18	1	0	3.411765	More Relevant
Facility management	21	10	2	1	3.5	More Relevant
Environmental management	20	8	6	0	3.411765	More Relevant

Table 16: Weighted average on system management.

3.6.5 Fundamental Economic Knowledge

The analysis on the relevancy of the fundamental economical knowledge was asked to stakeholders to understand the requirement of introduction of financial and economic analysis courses in the program. The survey results in Figure 19 showed the requirement of Statistics and Logistics and Energy Economics and Market analysis were marked as more relevant compared to business administration and investment and finance.

It can be concluded, that there is a need to introduce Statistics and Logistics as one of the modules or as unit in any one of the unit and energy economics is being offered in the current program for which contents needs to be reviewed to suit the market.

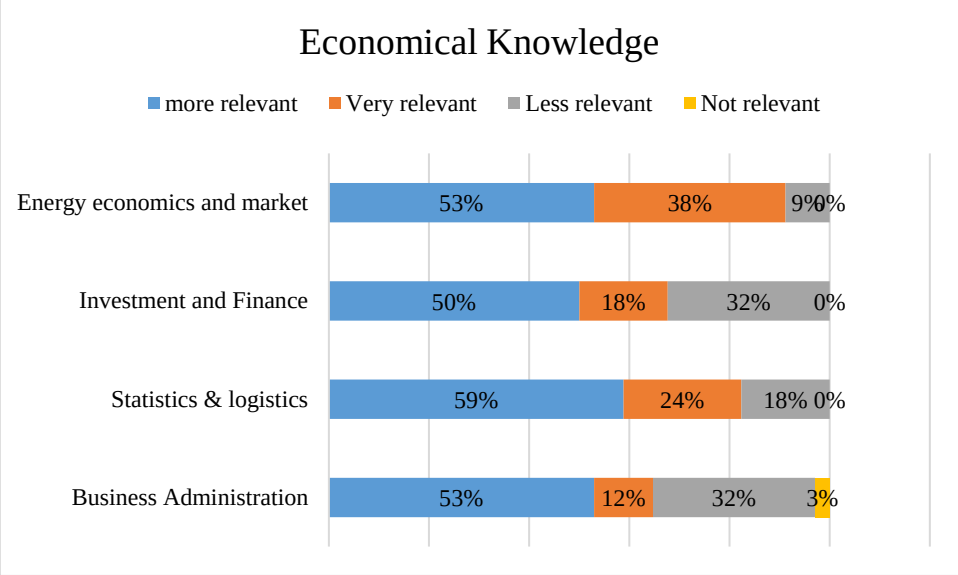


Figure 19: Relevance on economical knowledge.

Table 17 represents the Weighted average economic knowledge.

Fundamental economical knowledge	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Business Administration	18	4	11	1	3.147059	Very Relevant
Statistics & logistics	20	8	6	0	3.411765	More Relevant
Investment and Finance	17	6	11	0	3.176471	Very Relevant
Energy economics and market	18	13	3	0	3.441176	More Relevant

Table 17: Weighted average economical knowledge.

3.6.6 Methodological Competency

Methodological competency was evaluated with programming and simulation skills to model the electrical infrastructures and conduct studies to solve problems. The survey results in

Figure 20 showed that modelling and simulation studies using software as a very important and relevant in today's job market.

It can be concluded that the programme should introduce various simulation software for solving real life problems. Power System Simulation software and MATLAB were marked as one of the most relevant software packages.

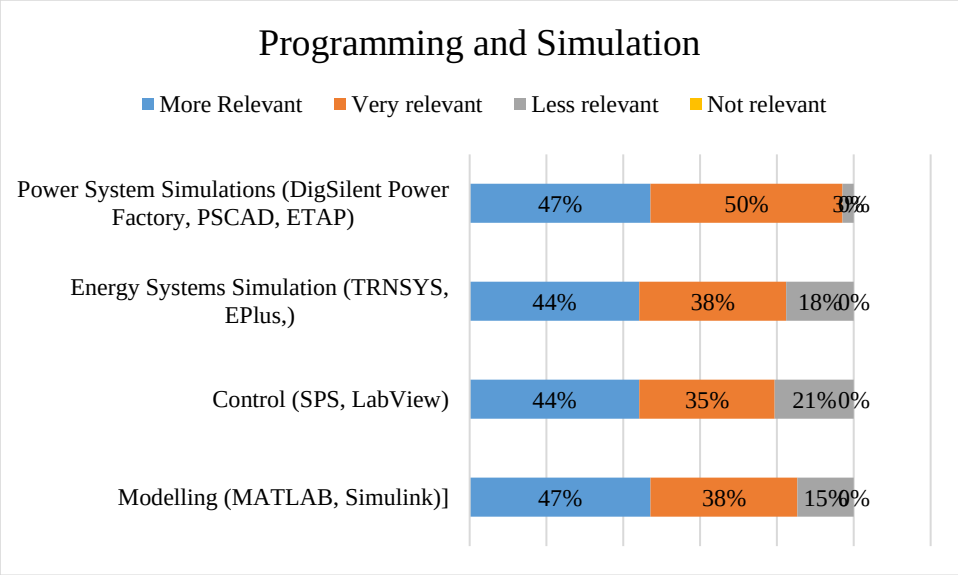


Figure 20: Methodological competency.

Table 18 represents the Weighted average of programming and simulation.

Programming and Simulation	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Modelling (MATLAB, Simulink)]	16	13	5	0	3.323529	More Relevant
Control (SPS, LabView)	15	12	7	0	3.235294	More Relevant
Energy Systems Simulation (TRNSYS, EPlus,)	15	13	6	0	3.264706	More Relevant
Power System Simulations (DigSilent Power Factory, PSCAD, ETAP)	16	17	1	0	3.441176	More Relevant

Table 18: Weighted average of programming and simulation.

3.6.7 Personal Competencies

The importance of personal competency in the job market was asked. It is found that competencies like Negotiation, presentation, and communications are very important and relevant in any job as represented by Figure 21. Generally, all the items listed were found to be very relevant except negotiation which was marked as neutral by 9% of the respondents.

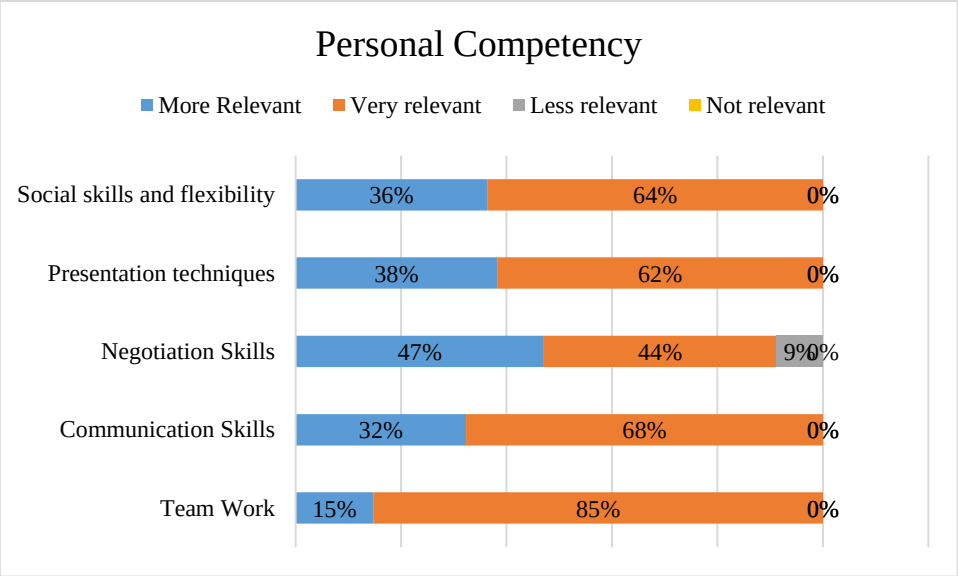


Figure 21: Importance of personal competencies.

Table 19 represents the Weighted average of personal competencies.

Personal competencies	More Relevant	Very relevant	Less relevant	Not relevant	Weighted Average	Remarks
Team Work	5	29	0	0	3.147059	Very Relevant
Communication Skills	11	23	0	0	3.323529	More Relevant
Negotiation Skills	16	15	3	0	3.382353	More Relevant
Presentation techniques	13	21	0	0	3.382353	More Relevant
Social skills and flexibility	12	21	0	0	3.363636	More Relevant

Table 19: Weighted average of personal competencies.

4. Conclusion

The demand for the energy and electricity in Bhutan is expected to increase with the establishment of the new industrial parks and with the development of the power intensive industries. This will give rise to the construction of many high and medium voltage industries and it is expected that demand growth in the industrial sector outpacing generation capacity addiction. In order to offset the import of energy in lean hydro seasons and to ensure energy security, Bhutan is already in the process to start the construction of three small hydropower plant with the total generation capacity of 104 MW in first phase and 261 MW have been shortlisted for feasibility studies under Phase II of the small

hydropower project.

The Sustainable Hydropower Development Policy, 2021 has also highlighted that the government will encourage development and integration of hydropower value chain by adopting emerging renewable energy technologies and innovations such as hybrid technologies, integrated energy management and smart grid systems. It is expected that with the greater deployment of the hybrid energy technology in the power system will increase its complexity and this will require for us to prepare our next generation of engineers to optimize the energy flow, develop solutions for intelligent, sustainable high-availability power flow control systems and to ensure the reliable energy supply for the growing industries and e-mobility in the country.

In order to meet the changing need of the power sector and industries in Bhutan, the Electrical Engineering programme will be focusing its overall objectives and imparting the proposed curriculum through technical innovation by using self-sustainable system design with technology as an enabler. Therefore, the current curriculum will include circularity concept, life cycle thinking methodology, and energy decentralization. The proposed programme includes two distinct areas of specializations through electives in the area of renewable energy and its integration and power system resilience. The college will also be supplementing with the above content in the curriculum, the national commitment to SDG7 and carbon neutrality.

Therefore, eACCESS project's support in the moderation of six core power system related module and the development of the switchgear protection laboratory is timely and would benefits the university and the industries in Bhutan.

STAKEHOLDER MEETING AND GRADUATE TRACER STUDY
Punatsangchhu-I Hydro Electric Project Authority

Day and Date: Thursday, 13th January, 2022

Time : 10:30 –1:00 PM

Venue : Conference Hall, PHPA-I

Members Present:

1. Ms. Chimmi Wangmo, AE Electrical

2. Ms. Kinga Pema, AE Electrical
3. Ms. Pema Choden, AEE Electrical
4. Mr. Namkha Gyeltshen, AEE Electrical
5. Ms. Kinley Zangmo, AEE Electrical
6. Mr. Arun Prasad Timsina, AEE Electrical
7. Mr. Cheku Wangchuk, AEE Electrical
8. Mr. Manoj Sharma, HoD EE, CST

STAKEHOLDER MEETING AND GRADUATE TRACER STUDY

Basochhu Hydro Power Plant

Day and Date: Friday, 14th January, 2022

Time : 11:30 –1:00 PM

Venue : Conference Hall, Basochhu Hydro Power Plant

Members Present:

1. Mr. Pema Gyeltshen, Tech (E)
2. Mr. Tenzin Jamtsho, AE (Electrical)

3. Mr. Tandin Wangchuk, JE (Electrical)
4. Mr. Dawa, Sr. SO (E)
5. Mr. Tshering Dendup, JE (M)
6. Mr. Jurme Wangchuk, Tech (E)
7. Mr. Kuenga Tshering, Executive Engineer
8. Ms. Yebi Demo, Asst. Instructor (TTI-K)
9. Ms. Sova Dootraj, Asst. Instructor (TTI-K)
10. Mr. Manoj Sharma, HoD EE, CST
11. Mr. Ugyen Rigzin, Student CST
12. Mr. Karma Dorji, Student CST
13. Mr. Karma Jurme, Student CST
14. Mr. Kezang Chedup, Student CST
15. Mr. Ugyen Rigzin, Student CST

STAKEHOLDER MEETING AND TECHNICAL VISIT

Bhutan Automation & Engineering Limited

Day and Date: Friday, 25th November, 2022

Time : 01:30 –4:30 PM

Venue : Bhutan Automation, Chhukha Bhutan

Members Present:

1	Suresh Sunwar, Executive Engineer. Bhutan Automation
2	Toupo, System Engineer, Bhutan Automation
3	Tsheten Dorji, Lecturer, Information Technology
4	Dr. Hari Kumar Suberi, Lecturer Electrical Engineering
5	Manoj Sharma, HoD, Electrical Engineering
6	Cheku Dorji, Asst. Professor, Electrical Engineering
7	Bikram Chhetri, Lecturer, Electrical Engineering
8	Namgay Tenzin, , Lecturer, Electrical Engineering
9	Gom Dorji, Lecturer, Electrical Engineering
10	Tashi Dema, , Asst. Lecturer, Electrical Engineering
11	Dorji Wangdi, Technician, Electrical Engineering
12	Nidup, Sr. Technician, Electrical Engineering
13	Pema Lhamo, Sr. Technician, Electrical Engineering
14	Karma Wangzom, Technician Electrical Engineering
15	Kezang Yuden, Asst. Lecturer, Civil Engineering
16	Purna Bdr. Bhujel, Technician, Civil Engineering
17	Rinchen Wangmo. Technician, Electronics & Communication
18	Khem Sharma, Accounts Officer
19	Karma , Driver

Soegijapranata Catholic University- Industrial Visit as Stakeholder Consultation

Preface

The Electrical and Power Engineering Study Program, Faculty of Engineering, Unika Seogijapranata visited some stakeholder, PT. Fuboru Indonesia, PT. Amarta Indah Otsuka is based in the cities of Sidoarjo and Pasuruan and eV Studio Denpasar, Bali.

PT. Fuboru Indonesia founded in 1983 and has existed for almost 38 years in the automotive parts industry. They are the pioneers in the gasket stamping industry in Indonesia. Currently they have a range of products including automotive parts for 2 wheels (motorcycle engine), 3 wheels (tricycle engine), 4 wheels (car engine), static engine spare parts and Job Orders spare parts (customization orders). They have made developments and improvements so that their vision to become the top 10 of automotive parts industry can be achieved. The Fuboru mission is always to provide the best service for customers both internally and externally. Products Quality Improvement is done through innovation and technology developments. Their efforts to maintain quality are carried out by doing process control, ranging from selection of raw materials, control of the production process, and finally to storage of finished goods. All we do is for customer satisfaction, so we're giving our best.

eV Studio Dewata is an electric vehicle service center currently based at JI. Gatot Subroto Timur 318X, Denpasar, Bali. Since December 2021, eV Studio Dewata has been actively involved in the sale of electric motorcycles and the provision of battery swapping stations or exchange places for batteries for electric motorcycles. eV Studio emerged from the dream of the President Director of PT. Fuboru Indonesia, namely Mr. Agung Heryan Widigdo, to make Indonesia's skies bluer and free from air pollution, so that the operation of eV Studio Dewata shall be a new idea for a healthier Indonesia. Their vision and mission are Be the Solution Not The Pollution For Brighter Sky, where they aim to be a solution while others increase air pollution in our environment and hope the skies on Earth where we live today become bluer. Currently, eV Studio Dewata is the main dealer of the Smoot Combat smart electric motorcycle, where this motorcycle uses a battery that can be replaced anywhere and anytime without having to charge it at home. This motorcycle is eco-friendly and is said to be more efficient and cost-effective compared to other traditional motorcycles. Smoot Combat electric motorcycle users can travel unlimited distances and never have to worry about running out of power in the middle of the road as battery

swapping is available at swapping stations throughout Circle-K Bali. In just 9 seconds, the depleted battery is replaced with a fully charged battery and is ready to continue driving. In addition, this motorcycle is also integrated with a smartphone to make it easier for users and make motorcycles safer with a smart locking system.

Industrial Consultation

The Electrical and Power Engineering Study Program, Faculty of Engineering, Unika Seogijapranata visited three companies. Three companies each PT. Fuboru Indonesia, PT. Amarta Indah Otsuka is based in the cities of Sidoarjo and Pasuruan and eV Studio Denpasar, Bali. During a visit to PT. The Fuboru Indonesia team receives information and production processes to print gaskets and spare parts for two wheels, three wheels, four wheels, static motorbikes and based on orders. The team had the opportunity to see directly the stages of the production process from raw materials to products. Technical Director of PT. Fuboru Indonesia Hendra hopes that the visit can provide insight and technical details for the seal printing industry and spare parts for two wheels, three wheels, four wheels, static motorbikes and to order. After receiving an explanation, the possibility of utilizing renewable energy that can be used in the automotive sector was discussed.

After visiting PT. The Fuboru Indonesia Team visited PT. Amerta Indah Otsuka which is located in Pasuruan. Considering that the company is a company that produces drinks and snacks, before entering the industrial area a security check will be carried out through the Peduli Lindungi application regarding the health of the participants. The company is one of seven affiliates committed to creating unique and innovative products, improving health and living a better life, and contributing to the lives of people around the world. Discussion on environmental commitment was also carried out in this meeting. This time, information about the product provided insight for the team to stay healthy and maintain physical condition. Students are invited to see firsthand the process of producing drinks and snacks developed by this company. Indah Supraptiningsih, HRD Division, emphasized that electrical engineering and power engineering graduates have a great opportunity to join PT. Amerta Indah Otsuka. He promised a good career and the opportunity to complete a 6 month internship in Germany to learn about the research and development of new production machines. The next day the team visited the company's eV Studio. This company is engaged in electric motors. Presentations on the development of electric motors were delivered to the team.

Very interesting and useful information was obtained from Ito Heru as the company manager regarding the product of the Tempur brand electric motor whose specifications are suitable for speeds of 60 km/hour with large torque.

In addition, information on the comparison of combat electric motorbikes with other types of electric motorbikes is also provided, namely cheaper prices with a lifetime guarantee. Participants will have the opportunity to test combat vehicles on the main streets of Denpasar.

Documentation

Conclusion

The SCU (Seogijapranata Catholic University) team's visit to PT. Fuboru Indonesia, PT. Amerta Indah Otsuka, and eV Studio proved highly informative and beneficial for the electrical and power engineering students.

At PT. Fuboru Indonesia, they witnessed the production process of gaskets and spare parts for vehicles, while discussing renewable energy possibilities. PT. Amerta Indah

Otsuka showcased their commitment to innovative products and offered career opportunities, including a 6-month internship in Germany.

Lastly, eV Studio provided insights into electric motors, including the Tempur brand's specifications and the advantages of combat electric motorbikes. The team even had the chance to test these vehicles on Denpasar's main streets. These visits broadened their understanding of industry applications, environmental commitments, and potential career paths. The knowledge gained will greatly contribute to their academic and professional growth in electrical and power engineering.

Kantipur Engineering College (KEC)

As part of Task 1.4, Kantipur Engineering College organized a stakeholder meeting that included two important activities: a workshop on the establishment, operation, and sustainability of a High Voltage Laboratory, and a bilateral meeting with Pokhara University. During the workshop, participants were provided with valuable insights into the processes involved in setting up and maintaining a High Voltage Laboratory. Various topics were covered, including infrastructure requirements, equipment selection, safety protocols, and long-term sustainability strategies. The workshop aimed to enhance the understanding of stakeholders regarding the importance and benefits of such a laboratory.

Additionally, a bilateral meeting was conducted between Kantipur Engineering College and Pokhara University. The purpose of this meeting was to foster collaboration and discuss potential areas of mutual interest. The representatives from both institutions explored possibilities for joint research projects, sharing of resources, and exchange programs related to high voltage engineering. These activities facilitated knowledge sharing, collaboration, and networking among relevant stakeholders. The establishment of a High Voltage Laboratory and the engagement with Pokhara University highlighted the commitment of Kantipur Engineering College to strengthen the educational and research capabilities in the field of high voltage engineering.

The field of automation is continuously emerging, with innovative methodologies, technologies, and practices so, under the support of eACCESS, KEC has successfully installed an Automation Laboratory, fully equipped with Programmable Logic Controllers (PLCs), Human-Machine Interfaces (HMIs), Supervisory Control and Data Acquisition (SCADA) systems, and integral switchgear components. The primary goal of this laboratory goes beyond the mere execution of experiments for engineering students. It is intended to operate as a valuable resource for our country, facilitating the enhancement of practical knowledge in the field of automation for interested technical manpower.

Workshop on "Establishment, operation and sustainability of High Voltage Laboratory"

Introduction:

A workshop was held on Oct 2, 2021 under the chairmanship of Rameshwar Rijal (Principal of Kantipur Engineering College) at Hotel Greenwich Village, Sanepa, Lalitpur from 09:45 to 16:45. Delegates from Pokhara University, Kathmandu University, Western Regional Campus, Nepal Electricity Authority and Kantipur Engineering College participated in the workshop. The following delegates from Pokhara University, Kathmandu University, Western Regional Campus, Nepal Electricity Authority and Kantipur Engineering College took part in that workshop.

S. no.	Name	Institution	Designation	Email	Phone
1	Mr. Rajesh Kumar Thagurathi	Pokhara University	Dean, Faculty of Science and Technology	deansct@pu.edu.np	9856015449
2	Mr. Om Prakash Giri	Pokhara University	Director, School of Engineering	omgi5@yahoo.com	9856027119
3	Mr. Buddhi Raj Joshi	Pokhara University	Former Dean, Faculty of Science and Technology	buddhirojana2@gmail.com	9856035449
4	Mr. Lalit Bikram Rana	Pokhara University	Assoc. Professor	rana.lalit@gmail.com	9841603726
5	Dr Sujan Adhikari	Pokhara University	Assoc. Professor	easujan@gmail.com	9840436793
6	Dr. Madhusudhan Kayastha	Pokhara University	Assoc. Professor	madhusudan@pu.edu.np	9823610720
7	Dr. Basanta Kumar Gautam	IoE Western Region Campus	Assoc. Professor	basantakg@yahoo.com	9856044598
8	Mr. Shiva Raj Pandit	Pokhara University	Administrative Head	panditrajshiva99@gmail.com	9856031399
9	Mr. Rameshwar Rijal	Kantipur Engineering College	Principal	rijal_rameshwar@kec.edu.np	9851037621
10	Dr. Keshar Prasain	Kantipur Engineering College	Vice Principal	kesharprasain@kec.edu.np	9843664825
11	Mr. Rabindra Khati	Kantipur Engineering College	HoD, Department of Computer and Electronics Engineering	rabindrakhati@kec.edu.np	9841462661
12	Mr. Tek Narayan Adhikari	Kantipur Engineering College	Examination Head	tna@kec.edu.np	9849555473

13	Mr. Dipesh Shrestha	Kantipur Engineering College	Sr. Lecturer	dipeshshrestha@kec.edu.np	9851214943
14	Mr. Buddha Bahadur Shakya	Kantipur Engineering College	Sr. Lecturer	buddhashakya@kec.edu.np	9849092247
15	Mr. Sushil Paudel	Kantipur Engineering College	Lecturer	sushilpaudel@kec.edu.np	9841570182
16	Mr. Bishal Rimal	Kantipur Engineering College	Lecturer	bishalrimal@kec.edu.np	9849900162
17	Dr. Shailendra Kumar Jha	Kathmandu University	Acting Head, Department of Electrical and Electronics Engineering	shailendra@ku.edu.np	9841273521
18	Mr. Tek Nath Tiwari Nepal Electricity	Nepal Electricity Authority	Chief, Major Transmission Line Projects	tntiwari@gmail.com	9851172222
19	Mr. Tanus Bikram Malla	Kantipur Engineering College	Lecturer	tanusmalla@kec.edu.np	9846139233

The workshop was conducted in the following three sessions. Before the commencement of the sessions Principal of KEC Mr. Rameshwar Rijal highlighted the significance of eACCESS project for the capacity building of higher education in engineering sector and relevance and need of engineers and technicians having excellent knowledge in high voltage technology in coming future in Nepal. Former Dean of Pokhara University, Buddhi Raj Joshi highlighted the different aspects of eACCESS project in Nepal and gave brief description about the different activities, progress and future challenges of eACCESS project.

The three sessions of the workshop were:

- **Academic use of the High Voltage Laboratory:** Experiments and Laboratory exercises
- **Broader Use of the High Voltage Laboratory:** Professional trainings, courses, testing of equipment/Expectations from the Industries
- **Successful Operation and Sustainability of the High Voltage Laboratory**.

Academic use of the High Voltage Laboratory: Experiments and Laboratory exercises:

According to the opinions of experts in High Voltage Engineering from Western Regional Campus, Pokhara University and Kathmandu University the list of experiments prepared by Pawel Rozga from Lodz University is suitable for both undergraduate, graduate courses

in High Voltage Engineering. Therefore, the High Voltage laboratory should be set up with different related equipment and instruments needed for performing those experiments. According to those experts the proposed lab set up can also be used for research purpose for students willing to do master thesis in High Voltage Engineering. Proposed lab can also be used for doing research on different kinds of insulators used in Nepal Electricity Authority. Transformer of the lab should be of higher energy so that voltage remains stiff even when the load draws high amount of current so that it can be used for research purposes which require high energy. If the proposed High Voltage Laboratory has facility for doing research in plasma physics too, researchers in physics might also use the lab for their research purpose.

Broader Use of the High Voltage Laboratory: Professional trainings, courses, testing of equipment/Expectations from the Industries

According to the expert from NEA, Nepal Electricity Authority has its own training centers at different locations in Nepal. Even then in coordination with NEA it can be arranged that fresh engineers visit high voltage laboratory at KEC so that they can have exposure to high voltage phenomena in lab.

Before delivering transformers to NEA, the transformer companies need to make sure that more than 50 parameters have been tested at an accredited lab. Nepalese Transformer manufacturers have to send their sample transformer to Central Power Research Institute, India for testing to get the certification and quality approval. High voltage Lab which is going to be established at KEC is therefore not suitable for testing transformers from industries. For industrial use of laboratory other equipment related to transformer testing needs to be added. But if such lab could be established at KEC it could be a valuable asset for Nepal.

There are many cable industries in Nepal. They have their own testing facilities in their factories. Establishing a cable testing facility at KEC could be useful not only for providing exposure to engineering students but also for rechecking and comparing the test results from different labs in Nepal.

It will not be possible to conduct technical professional courses at proposed laboratory set up because the lab is oriented to academic and research purpose. Moreover, the need of trainings differs from industry to industry such as transformer manufacturing, cable manufacturing, transmission line installation etc. It is therefore difficult to design trainings to cater to participants from all such industries.

Participating delegates agreed to assist KEC in its survey for training needs assessment which will be conducted through Google online form and the link to the form will be made available to all the participating delegates.

Trainings related to lightening arrester installations, earthing of equipment and substations, occupational safety in high voltage installations, transformer and cable testing training could attract engineers and technicians to such trainings. But the trainings should be more focused on actual problems they face at their job. If KEC wants to avail of such provisions in the future the present laboratory should be designed in such a way that such facilities could be added in the future. The site should also be selected keeping the possibility of future extension of the lab in mind.

Successful Operation and Sustainability of the High Voltage Laboratory

Availability of trained manpower is of paramount importance for operation and long term sustenance of the laboratory. Therefore, during the installation and training of the High Voltage Laboratory all concerned people from Pokhara University and Kantipur Engineering College should be involved to broaden and deepen the institutional memory.

Refreshment training should be conducted at least once a year concerning engineers and technicians from Pokhara and Kantipur Engineering College at the laboratory.

People working at High Voltage Laboratory should have good knowledge about safety measures to be adopted at the laboratory. Engineers and technicians working at the laboratory should be protected with accident or hazard insurance schemes. All the documents, user manuals, maintenance manuals, list of equipment should have multiple copies and should be kept safely and securely.

Certain budget should be allocated for periodical maintenance of the instruments and equipment.

When there is change of personnel proper and documented hand over and take over procedure should be followed and should also be documented.

Conclusion:

At the end of the workshop Dean of Pokhara University expressed his support for the project. He agreed to enhance the cooperation and coordination between Pokhara University and Kantipur Engineering College during and also after the completion of the project. He expressed his commitments to undertake measure to make sure that the High Voltage Laboratory established at KEC will be fully utilized by different engineering colleges affiliated to Pokhara University located at different parts of Nepal. He stressed

that more such workshops should be conducted in the coming future to explore further areas of cooperation and for resolving the different issues arose during the project.

Bilateral Meeting between Pokhara University and Kantipur Engineering College

A Bilateral Meeting was held on Oct 1, 2021 under the chairmanship of Rameshwar Rijal (Principal of Kantipur Engineering College) at Hotel Greenwich Village, Sanepa, Lalitpur from 15:00 to 16:45 between Pokhara University and Kantipur Engineering College under eACCESS Project of ERASMUS+ Programme of European Union with the aim of finding common targets within the scope of eACCESS Project, strengthening the ties between PU and KEC and discussing on the contract agreement between PU and KEC about using High Voltage Laboratory. The following participants from Pokhara University and Kantipur Engineering College took part in that bilateral meeting:

S. no.	Name	Institution	Designation	Email	Phone
1	Dr. Rajesh KumarThagurathi	Pokhara University	Dean, Faculty of Science and Technology	deansct@pu.edu.np	9856015449
2	Mr. Om Prakash Giri	Pokhara University	Director, School of Engineering	omgi5@yahoo.com	9856027119
3	Mr. Buddhi Raj Joshi	Pokhara University	Former Dean, Faculty of Science and Technology	buddhirojana2@gmail.com	
4	Mr. Lalit Bickram Rana	Pokhara University	Assoc. Professor	rana.lalit@gmail.com	9841603726
5	Dr Sujan Adhikari	Pokhara University	Assoc. Professor	easujan@gmail.com	9840436793
6	Dr. Madhusudhan Kayastha	Pokhara University	Assoc. Professor	madhusudan@pu.edu.np	9823610720
7	Dr. Basanta Kumar Gautam	IoE Western Region Campus	Assoc. Professor	basantakg@yahoo.com	9856044598
8	Mr. Shiva Raj Pandit	Pokhara University	Administrative Head	panditrajshiva99@gmail.com	9856031399
9	Mr. Rameshwar Rijal	Kantipur Engineering College	Principal	rijal_rameshwar@kec.edu.np	9851037621
10	Dr. Keshar Prasain	Kantipur Engineering College	Vice Principal	kesharprasain@kec.edu.np	9843664825
11	Mr. Rabindra Khati	Kantipur Engineering College	HoD, Department of Computer and Electronics Engineering	rabindrakhati@kec.edu.np	9841462661

12	Mr. Tek Narayan Adhikari	Kantipur Engineering College	Examination Head	tna@kec.edu.np	9849555473
13	Mr. Dipesh Shrestha	Kantipur Engineering College	Sr. Lecturer	dipeshshrestha@kec.edu.np	9851214943
14	Mr. Buddha Bahadur Shakya	Kantipur Engineering College	Sr. Lecturer	buddhashakya@kec.edu.np	9849092247
15	Mr. Bishal Rimal	Kantipur Engineering College	Lecturer	bishalrimal@kec.edu.np	9849900162

The participants in the meeting discussed on following agendas:

- Common target of PU and KEC within the scope of the project
- Strengthening the ties between PU and KEC during and after the project
- Contract agreement between PU and KEC about using the High Voltage Laboratory established at KEC.

a. Common target of PU and KEC within the scope of the project

eACCESS Project has three pillars namely curriculum development, teaching and learning platform development, infrastructure development. During the discussion it was agreed to identify common targets under these three pillars of the project.

i. Curriculum development,

- Pokhara University being a university has more capability in terms of number, experience and exposure. It will therefore provide assistance to KEC in course development if related faculties are available in the development of some subject, especially from the graduate course.

ii. Teaching and learning platform development,

- A Moodle platform development and operation team will be formed at PU and KEC.
- Regular web meeting will be held between two teams at least once a month to exchange experiences, difficulties and challenges in the job.
- The two teams will jointly organize training programs for providing trainings to other teachers and staff from PU and KEC which will be held at PU and KEC.

iii. Infrastructure development

- It was agreed that High Voltage Laboratory will be established at Kantipur Engineering College.

- Pokhara University will assist KEC in preparing specifications of the laboratory equipment if help is needed.
- The teaching and laboratory staff of both PU and KEC will get involved during installation and training of High Voltage laboratory so that a pool of trained technicians will be available for long term sustenance of the lab.
- Till now PU has been running undergraduate and graduate courses in high voltage without laboratory. Therefor after the establishment of high voltage laboratory PU will use the Laboratory for its undergraduate courses, graduate courses and for students are willing to do research for their thesis purposes.
- All the affiliated colleges of PU located in different locations of Nepal will also have access to High Voltage Lab at KEC.

b. Strengthening the ties between PU and KEC during and after the project

i. More workshops will be held between PU and KEC in the future related to different issues in the project.
ii. Regular web meetings will be held between PU and KEC to enhance communication between the two organizations.
iii. Students of PU will make visits to KEC HV lab during their industrial visits' programs.

c. Contract agreement between PU and KEC about using the High Voltage Laboratory established at KEC.

i. A detailed line to line discussion was done on each and every sentence of the contract agreement document.
ii. The contract agreement document was finalized after PU incorporated suggestions from its in-house legal unit.
iii. It was agreed to sign the Contract agreement for the use of High Voltage Laboratory after the end of workshop on the next day.

Bilateral Meeting with EDIBON and YALONG Tech. to prepare high voltage laboratory specifications.

A bilateral meeting was held several times dated (2021 and 2022) between EDIBON and YALONG Tech. to discuss and prepare specifications for a high voltage laboratory. The purpose of the meeting was to collaborate and pool their expertise in order to define the necessary requirements and specifications for the establishment of the laboratory.

During the meeting, representatives from both companies engaged in detailed discussions regarding the equipment, infrastructure, and safety measures needed for a high voltage laboratory. They shared their knowledge and experience to ensure that the laboratory would meet the highest standards and cater to various research and educational needs.

EDIBON, a renowned provider of technical teaching and research equipment, contributed their expertise in laboratory design and equipment selection. They brought valuable insights into the latest technological advancements and best practices in the field.

YALONG Tech., a leading manufacturer in Chinese industry of high voltage equipment, offered their expertise in high voltage systems and electrical engineering. They provided insights into the specifications and features required for the laboratory's equipment, ensuring that it would meet the specific needs of high voltage experiments and research.

The bilateral meeting resulted in the collaborative development of comprehensive specifications for the high voltage laboratory. The expertise and input from both EDIBON and YALONG Tech. ensured that the laboratory would be well-equipped, safe, and capable of facilitating advanced research and practical learning in the field of high voltage engineering.

Workshop on “Automation Training Course Development”

On 4th Sep 2023, KEC successfully conducted a one day workshop on “Automation Training Course Development”. The objectives of the workshop were:

- Finalization of the drafted Training course and other related contents
- Exploration of the strategies for incorporating development of hands-on practical exercises, simulations, or real-world projects into the training course to reinforce learning and build practical skills.
- Feedback for Improvements from participants and stakeholders to continuously improve the training course.
- Quality Assurance for maintaining the quality and consistency of training materials and delivery across different training sessions.
- Exploration of Opportunities for the sustainable use of laboratory and further possible future collaboration
- Further discussion on collaborations on sustainable use of laboratory

Prior to the workshop, KEC had drafted an outline of the training course and invited participants from different sectors. During the workshop, 15 participants from industries, academics and service sector actively engaged to strengthen the outline of the training course. The workshop finalized the outline of the training course. The list of the workshop attendees is attached below.

Capacity Building in the field of higher education

Workshop on "Automation Training Course Development"

Date: September 4, 2023

Organizer: Kantipur Engineering College Supported by eACCESS project

List of Participant

S.N	Organization	Name of Person	Designation	Morning Shift	Day Shift
1	KEC	Prof. Rameshwar Rijal	Chairman		
2	KEC	Prof. Keshar Prasain	Principal		
3	KEC	Mr. Sushil Paudel	Sr. Lecturer		
4	KEC	Mr. Bishal Rimal	Sr. Lecturer		
5	NEA	Mr. Umanga Karki	Asst. Manager		
6	Kathmandu Valley Water Supply Mgmt. Board	Mr. Prashant K. Shah	Electrical Engineer		
7	IOE, TU	Mr. Shabudhin Khan	Lecturer		
8	Urja Developlers	Mr. Suraj G.C	Electrical Engineer		
9	Varun Beverage	Sanjeet Kr. Yadav	Production Executive		
10	Thoplo Machine	Mr. Krishna Keshav Chaudhary	CEO		

Capacity Building in the field of higher education

S.N	Organization	Name of Person	Designation	Morning Shift	Day Shift
11	Thoplo Machine	Bishal Bhetwal	Engineer		
12	Teaching Hospital, TU	Mr. Rajesh Acharya	Maintenance Department		
13	Eco Infra builder.	Mr. Manoj Lekhak	Co-founder, Electrical Engineer		
14	Adwell International P. Ltd	Mr. Ajay Singh	Manager		
15	Thoplo Machine	Ram Prasad Poudel	Project Manager		

Photograph of the workshop

Figure 22 represents some snaps taken during the workshop.

Figure 22 Workshop on "Automation Professional Course Development

Future Plan

After this consultation with industrial professionals, KEC has planned to develop and conduct the professional course.

The Atma Jaya Catholic University of Indonesia-Industrial Visit as Stakeholder

Consultation

Introduction

The Department of Electrical Engineering of the Faculty of Engineering, Atma Jaya Catholic University of Indonesia visited the PT. Surya Utama Putra (SUP) in order to conduct the discussion for the development of the PV laboratory. At first, ATM Visited the SUP Factory and then discussed the planning and design to build the PV Laboratory. The other company that the ATM visited is PT Tri Tunggal Sumber Solusi.

PT. SURYA UTAMA PUTRA is a company operating in the field of renewable energy, especially solar energy. Founded in 2009, it has human resources who are competent, expert, young, creative, innovative and always follow technological developments. Using a land area of 8,200 m² and a building area of 3,240 m², located in the Rancaekek area, West Java, in every production activity we are always committed to product quality, the best service, environmental maintenance, occupational health and safety, in accordance with our ISO standards. namely: ISO (9001:2008), ISO (14001:2004) and ISO (18001:2007). PT. solar panel production capacity. SURYA UTAMA PUTRA has reached 45 MW/year. As a form of our commitment to the environment, the area around the building was developed as a green area. We are also a member of the Indonesian Solar Module Manufacturers Association (APAMSI) and a member of the Indonesian Luminaire Association (ALINDO). Several solar power applications which are products of PT. SURYA UTAMA PUTRA are as follows: 1. Solar Panels 2. Student Lights 3. Public Street Lighting 4. Solar Home System 5. Off Grid PLTS 6. ON Grid PLTS 7. Micro Grid 8. PATS (Solar Water Pump) 9. Multimedia cart 10. Battery 11. Vaccine refrigerator (Vaccine Cooler) PT. SURYA UTAMA PUTRA is experienced in designing, building, and implementing solar power-based technology applications. We also work on several projects, especially development projects in outermost areas throughout Indonesia.

The PT. TRITUNGGAL SUMBER SOLUSI Established since early 2013, PT. TRITUNGGAL SUMBER SOLUSI has built customer's trust in various industries such as Oil and Gas, Water Treatment, Power Plant, Petrochemical, etc. PT. TRITUNGGAL SUMBER SOLUSI serves and supports customers focusing on Electrical Control, Factory and Process Automation Engineering, Design, and Installations.

Conclusion

We made the final decision based on their recommendation we agreed to use them as our consultant to build the PV Laboratory to establish laboratory in Atmajaya Catholic University of Indonesia.

In conclusion, the visit by the Department of Electrical Engineering from Atma Jaya Catholic University of Indonesia to PT. Surya Utama Putra (SUP) and PT. Tri Tunggal Sumber Solusi was an enriching and valuable experience. The engagement began with a thorough exploration of SUP's facilities, showcasing their commitment to renewable energy and the impressive scale of their solar panel production. The subsequent discussions regarding the development of the PV laboratory provided valuable insights into the practical aspects of implementing solar power-based technologies.

Furthermore, the visit to PT. Tri Tunggal Sumber Solusi highlighted their pivotal role in various industries, emphasizing their expertise in Electrical Control, Factory, and Process Automation Engineering. The exchange of ideas and information during these visits has undoubtedly contributed to the academic and practical knowledge of the participants.

The Department of Electrical Engineering expresses its gratitude to both companies for generously sharing their expertise, experiences, and fostering a collaborative environment. This interaction has not only strengthened the academic-industry partnership but has also inspired the pursuit of innovative solutions and advancements in the field of electrical engineering. As we look towards the future, the knowledge gained from these visits will undoubtedly

shape the direction of the PV laboratory development and contribute to the education and training of future engineers. The Department looks forward to further collaborations and endeavors that bridge the gap between academia and industry, ultimately contributing to the sustainable development of renewable energy technologies in Indonesia and beyond.

Pokhara University:

Online Workshop related to Power System

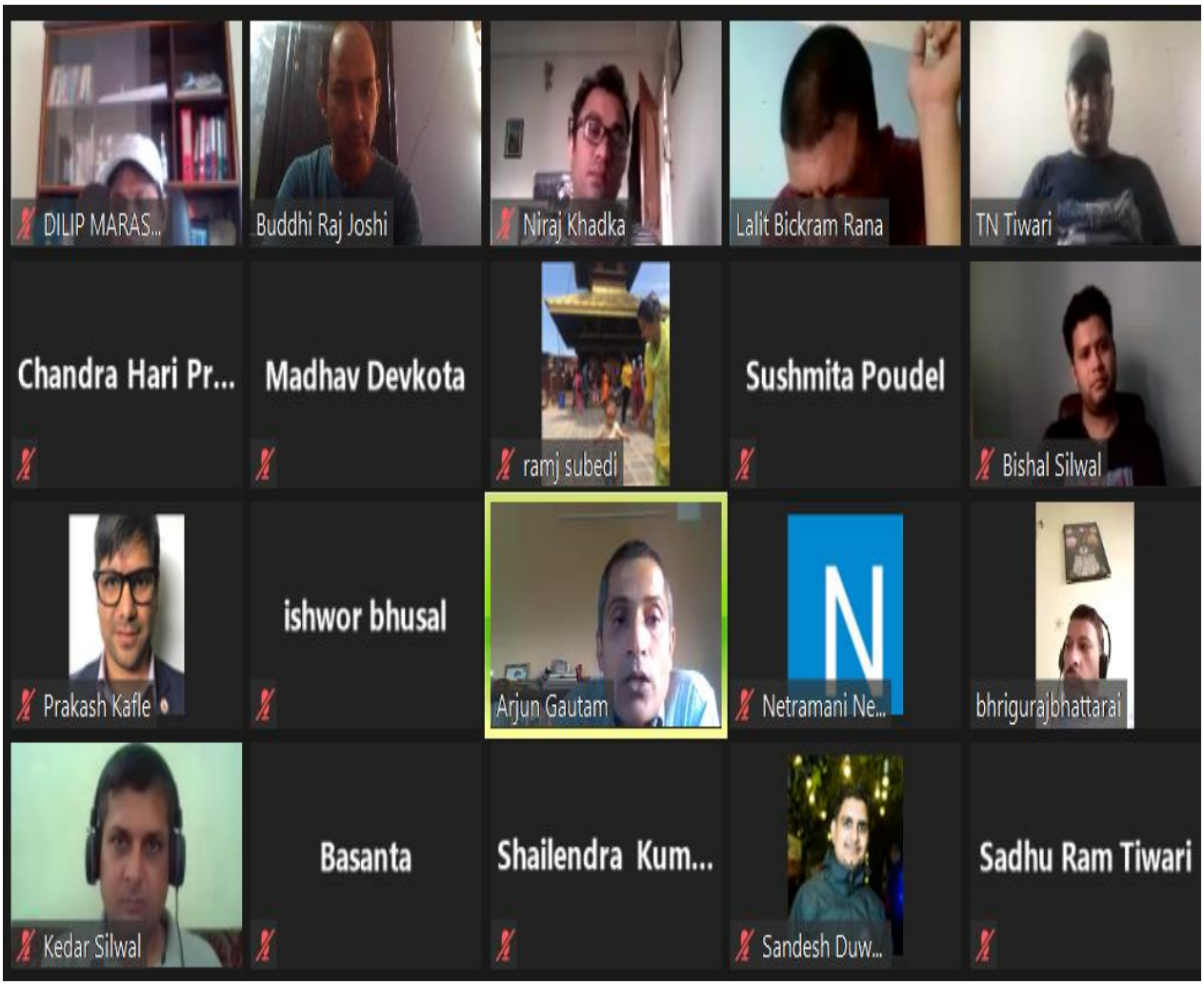
The first virtual workshop related to power system was organized by Faculty of Science and Technology (FoST), Pokhara University on 12th Sept 2020, with the aim to disseminate of eACCESS project activities to the utility company professional and graduate students. This workshop was divided into three sessions as eACCESS project activities dissemination session, industry experience sharing session and academic experience sharing session. There were 20 participant in the program from different industry and university.

In the first session of the workshop, Er. Budhhi Raj Joshi, Dean of FoST, disseminated the major activities of the eACCESS project that were accomplished and the scope of the project. During this session, he shared all the three pillar of eACCESS project, who is responsible and what we are doing in every pillar.

In the second session, we have invited guest speaker Er. Teknath Tiwari, Regional Director, Nepal Electricity Authority (NEA), Gandaki Province highlighted and discussed on the "**Challenge and Opportunity in Power Distribution and Transmission Networks of Nepal**". This session he talks about detail current status scenario as well as future road map of power distribution and transmission network of Nepal. This session was helpful for all industry experts, faculty, as well as to graduate student of electrical engineering program.

In the last session, we have invited two distinguish guest speaker from academic sector, Dr. Shailendra Kumar Jha, Associate Professor, Kathmandu University and Dr. Basanta Kumar Gautam, Associate Professor, Institute of Engineering, Tribhuban University. They have highlighted and discussed on "**Trends and Challenges for M.Sc. Thesis**". This session was specially focused for the graduate student studying in M.Sc in Electrical Engineering in Power System. The students were able to learn different possibility in different aspect in order to conduct their MSc thesis.

At last, the virtual workshop was concluded by Er. Lalit Bickram Rana, M.Sc. EEPS program coordinator by giving vote of thanks as well as discussed on different millstones for graduate thesis, opportunity and scope within the project.



Snapshot of participant during virtual workshop

Workshop for preparation of final draft of syllabus

After rigorous meeting and discussion about drafting different subjects related to power system linked with eACCESS project, Faculty of Science and Technology, Pokhara University identified the following subject experts within the country was able to develop the draft syllabus as mentioned in table 20 below:

Courses Of the Bachelor Program			
S.No	**Name of Course**	**Credit**	**Name of Faculty / Current Organization**
1	Renewable Energy and Grid Integration	3.1.2	Dr. Sujan Adhikari, Associate Professor, School of Engineering, Pokhara University

2	Power System Simulation and Modeling	3.1.2	Dr. Bishal Silwal, Associate Professor, School of Engineering, Pokhara University
3	High Voltage Engineering	3.1.2	Dr. Basnata Kumar Gautam, Associate Professor, Institute of Engineering, Tribhuban University
4	Industrial Automation	3.1.2	Er. Lalit Bickram Rana, Associate Professor, School of Engineering, Pokhara University
Master Level Courses			
1	Extra High Voltage Engineering	3.0.0	Dr. Basnata Kumar Gautam, Associate Professor, Institute of Engineering, Tribhuban University
2	Energy Management and Audit	3.0.0	Er. Lalit Bickram Rana, Associate Professor, School of Engineering, Pokhara University Dr. Shailendra Kumar Jha, Associate Professor, School of Engineering, Kathmandu University
3	Smart Grids		Dr. Sujan Adhikari, Associate Professor, School of Engineering, Pokhara University Dr. Shailendra Kumar Jha, Associate Professor, School of Engineering, Kathmandu University
4	Transients In Electrical Power System	3.0.0	Er. Lalit Bickram Rana, Associate Professor, School of Engineering, Pokhara University Dr. Sujan Adhikari, Associate Professor, School of Engineering, Pokhara University

5	Electromagnetic Field Computation	3.0.0	Dr. Bishal Silwal, Associate Professor, School of Engineering, Pokhara University
6	Soft Computation	3.0.0	Dr. Rakesh Katwal, Fuse Nepal Er. Manish Pyakurel, Associate Professor, Institute of Engineering, Tribhuban University

Table 20 Bachelor level and master level courses of PU

In order to finalized final draft of syllabus prepared by the respective resource person listed above, the Dean office, Pokhara University and Curriculum Director Office (CDC) organized a workshop by inviting all subject committee members / Experts from the industry like Nepal Electrical Authority / Private Hydropower Developer /Experts from other Universities on 25 Jan 2022 at Landmark hotel, Kathmandu. In that workshop, the syllabus of the course was presented by respective subject expert and collect the feedback from the experts from industry and other university, Finally, presented draft of syllabus was amended and final draft of syllabus was prepared and forwarded to deans office for the further processes. The list of the experts and their organization was presented in Table. Then, Dean Office forwarded the second draft to the subject committee via CDC.

S. No	Name	Position	Organization
1	Prof. Rajesh Thagurathi	Dean	FoST
2	Prof. Dr/ Bhupendra Bimal Chettri	Professor	School of Engineering Kathmandu University
3	Prof. Dr. Arbind Kumar Mishra	Professor	Institute of Engineering TU
4	Prof. Dr. Navaraj Karki	Professor	Institute of Engineering TU
5	Prof. Dr. Keshav Dahal	Professor	University of south Scotland
6	Er. Anup Kumar Upadhyaya	Fromer Energy Secretary	Ministry of Water Resources and Energy
7	Er. Hitendra Dev Shakya	Manging Director	Nepal Electricity Authority

8	Assoc. Prof Dr. Shailendra K. Jha	Assoc. Prof	School of Engineering Kathmandu University
9	Er. Rameshwar Rijal	Principal	Kathmandu Engineering College
10	Assoc. Prof Dr. Basanta K. Gautam	Assoc. Prof.	Institute of Engineering TU
11	Assoc. Prof. Lalit B. Rana	Assoc. Prof	School of Engineering PU
12	Assoc. Prof. Dr. Sujan Adhikari	Assoc. Prof	School of Engineering PU
13	Asst. Prof. Dr. Bishal Silwal	Asst. Prof.	School of Engineering Kathmandu University
14	Er. Deepak Chand	Director	Civil Aviation Nepal
15	Dr. Rakesh Katuwal	Engineer	Fusemachines Nepal Pvt. Ltd
16	Er. Sushil Paudel	Asst .Prof	Kantipur Engineering College
17	Er. Bishal Rimal	Asst .Prof	Kantipur Engineering College

Pictures of the program:

BILATERAL MEETING BETWEEN PU AND KEC

Program Schedule
Dec 27, 2021

Time	**Activity**
3:45 – 4:00	Registration
4:00 – 4:15	Program Highlights
4:15 – 4:30	Highlights on eACCESS project related activities in Pokhara University
4:30– 4:45	Highlights on eACCESS project related activities at KEC
4:45 – 5:45	Q & A Session

Participants from PU

1. Assoc. Prof. Rajesh Kumar Thagurathi, Dean
2. Assoc. Prof. Lalit Bickrum Rana
3. Assoc. Prof. Bashant Gautam
4. Assoc. Prof. Madhusudhan Kayastha
5. Assoc. Prof. Sujan Adhikari
6. Er. Buddhi Raj Joshi
7. Er. Bharat Sharma
8. Subash Adhikari, Account Officer

Participants from KEC

1. Er. Rameshwar Rijal
2. Dr. Keshar Prashai