ENERGIZING EDUCATION PROGRAM (EEP)
PHASE II FEMALE STEM INTERNSHIP
Training and Capacity Building

REA
RURAL ELECTRIFICATION AGENCY
ENERGY=EMPOWERMENT=EFFICIENCY

THE WORLD BANK

CEESOLAR®

Project Completion Report

January, 2024

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Executive Summary

INTRODUCTION

The Energizing Education Program (EEP) Phase II is an initiative by the Rural Electrification Agency of Nigeria (REA), through the Nigerian Electrification Project (NEP) funded by the World Bank to provide energy access to 7 federal institutions across the 6 geopolitical zones in Nigeria. The program includes a 12-week training and capacity-building internship program for 140 female STEM students, and Ceesolar Energy Ltd is the consultant for the training program.

PROJECT SCOPE

The project scope entailed the development of a training curriculum, selection of the best-fit students, development of a robust e-learning platform, provision of capacity building, post-internship opportunities, and the maintenance of proper documentation and reporting. We adopted a systematic approach to ensure compliance to the project scope, quality implementation of the project and timely delivery. This approach included the foundational training courses, practical training sessions, and performance assessments. The project was delivered over a 24-week contract duration.

CURRICULUM AND LEARNING MANAGEMENT SYSTEM

We developed a Curriculum and Online Learning Platform for training delivery. The curriculum consisted of 12 modules, and the development process took into account factors such as Needs Assessment, Learning Objectives, Content Planning, Instructional Design, Content Creation, Assessment and Evaluation, Case Studies and Industry Examples, and Alignment with Standards. The training was delivered mainly through the online learning management software called EEP SIPA.

STUDENT SELECTION PROCESS

The selection process was one of the most important aspects of the project, as REA was committed to selecting the most qualified students. To achieve the REA goals for the selection process, we conducted a mock session of the process and communicated the results with the REA team.

We received a shortlist of 289 students from 7 institutions, and selected 140 students through a robust student selection process. This process consisted of two stages - Awareness & Registration and Virtual Interview. At the first stage, students filled out a registration form which received a 76% response rate, the students provided general information on themselves and their understanding of renewable energy. At the second stage, students made a case for why they should be selected, by writing an essay, students were assessed on their interest levels and commitment to be finally selected.

TRAINING DELIVERY

The first step of the training process was an in-house mock exercise of the training delivery, which focused on the use of the EEP SIPA. This was followed by

the onboarding of students, educators, and GBV representatives on EEP SIPA, where user accounts were created, and a system was created to ease communication between stakeholders. The training had a hybrid mode of delivery, which included classroom training, virtual sessions, self-learning, and basic practical sessions.

The students were provided with training materials and other resources to support them, such as a notepad, writing pens, a learning device, a tote bag, as well as a modest data subscription. Some PPEs were also provided to the students for on-site practical sessions.

POST INTERNSHIP OPPORTUNITIES

In line with the project scope, and the need to further the value of the training, we developed a comprehensive post-internship training and mentorship program to nurture their skills further and guide the female students toward impactful careers in the renewable energy sector. The opportunities to students involve, Workshops and Events for Students, Professional Mentorship and Guidance, SIWES and Industrial Training Placements, and Job Placements.

FEEDBACK AND RECOMMENDATIONS

After the completion of the final assessment, we received feedback from participants of the trainings.

This feedback provides insight to REA on the reception of the program. A total of 123 students took part in the feedback exercise, and their responses were documented. The majority of participants expressed satisfaction with the REA program, Resourcefulness of training materials and Educators, etc. Overall, participants highly valued the course, expressing satisfaction with its effectiveness and the quality of the learning experience.

LESSONS LEARNT AND RECOMMENDATIONS

The Ceesolar team learnt the following from the program; the importance of mock sessions: importance of a thorough selection process; take into consideration departments, and levels of students during shortlisting, and the importance of enhanced stakeholders' engagement.

Some key recommendations based on feedbacks are to conduct more Interactive virtual sessions; provide real-world application workshops; diversify reading materials; and provide professional development opportunities for students.

01
Introduction

1.1 EEP Phase II STEM Internship Program

The Energizing Education Program (EEP) Phase II is an initiative of the Rural Electrification Agency of Nigeria (REA), under the Nigeria Electrification Project (NEP) which is funded by the World Bank.

The REA has initiated the program to provide energy access to 7 federal institutions across the 6 geopolitical zones in Nigeria. As part of the program, twenty (20) female STEM students from each benefiting institution partook in an internship program.

The Internship program consists of the training and capacity building of the 140 selected students on the fundamentals of renewable energy for 12 weeks. At the completion of the program, students were issued a training certificate and the outstanding ones among the lot would be offered internship opportunities.

Ceesolar Energy Ltd (Ceesolar), an indigenous renewable energy firm in Nigeria, with a track record of capacity building, was contracted as the implementer of this project.

1.2 Final Report

This comprehensive report signifies the conclusion of the STEM Internship training and capacity-building aspect of the EEP Phase II project. The report consists of a summary of activities carried out during the various phases of the project which include the inception, training curriculum and learning management system development, student selection process, training delivery, and the post-internship opportunities. The report also highlights the challenges faced, mitigation strategies implemented, and feedback obtained from stakeholders and the resulting recommendations.

By delving into each phase's intricacies, the report aims to present a holistic understanding of the methodologies employed and the key activities of the project.

02
Project Scope

2.1 Project Objectives

The following are objectives for the capacity-building exercise, these align with the overall goal of the EEP:

1. Provide hands-on foundational training and capacity building to 20 female students from each beneficiary institution (BIs) across EEP Phase II, on the fundamentals of renewable energy.

2. Provide continued skill/capacity building after completing the STEM Internship Program.

3. Develop enough capacity in the trained students that not only give them knowledge but also prepare them for a career in the renewable energy sector.

4. Develop a system during the implementation of the project that supports the REA in executing similar projects under the EEP in the future.

2.2 Stakeholders and Responsibilities

To ensure a seamless and successful project implementation, some key stakeholders were outlined to collaborate in different ways and on different levels, each with their unique offerings. These stakeholders and their responsibilities are as follows:

2.2.1 Stakeholders
2.2.1.1 REA

The Rural Electrification Agency (REA), an agency of the Federal Government of Nigeria, through the Nigeria Electrification Project (NEP) is promoting the increase of access to energy through off-grid electrification strategies. The REA is mandated to promote rural electrification in the country, coordinate rural electrification programs, and effectively administer the Rural Electrification Fund (REF) to promote, support, and provide rural electrification.

2.2.1.2 Ceesolar Energy Limited

Ceesolar Energy Ltd (Ceesolar) is an indigenous renewable energy company registered as a developer under the Nigeria Electrification Project (NEP) Performance Based Grant (PBG) Program. Ceesolar specialises in developing and constructing solar mini-grids for unserved and underserved communities and commercial and industrial businesses. Ceesolar is also in the business of providing capacity-building & and training services on renewable energy-related topics.

2.2.1.3 Beneficiary Institutions

The Internship Program will take place in 7 universities across the 6 geo-political zones. Ceesolar will train 20 female STEM students in each of the following institutions:

1. University of Abuja, FCT.
2. Michael Okpara University of Agriculture, Abia State.
3. University of Calabar and Teaching Hospital, Cross River State.
4. University of Maiduguri and Teaching Hospital, Borno State.
5. Federal University of Agriculture Abeokuta, Ogun State.
6. Federal University, Gashua, Yobe State.
7. Nigeria Defence Academy, Kaduna State

Figure 1: University of Abuja, FCT

Figure 2: Michael Okpara University of Agriculture, Abia State

Figure 3: University of Calabar and Teaching Hospital, Cross River State

Figure 4: University of Maiduguri and Teaching Hospital, Borno State

Figure 5: Federal University of Agriculture Abeokuta, Ogun State

Figure 6: Federal University, Gashua, Yobe State

Figure 7: Nigeria Defence Academy, Kaduna State

2.2.2 Stakeholder Responsibilities

Table 1: Stakeholder Responsibilities

S/No.	Stakeholders	Responsibilities
1	Rural Electrification Agency (REA)	The REA is the originating and implementation body of the Energy Education Program (EEP), an initiative of the federal government of Nigeria. The agency was responsible for selecting the best contractor for executing the project, while also providing support in ensuring all stakeholders work collaboratively and seamlessly. The agency also had the responsibility of identifying the beneficiaries of the project and introducing the project executor to them. The NEP Project Management Unit (PMU) of the REA led the implementation of this project.
2	The World Bank	The World Bank is the funding body of the Energizing Education Program. Funding has been provided by this organization to support phase II of the project, which involves capacity building for 7 federal universities, and by extension provision of reliable, affordable and sustainable electricity. These funds were utilized for the execution of the project, which encompasses project development, selection, capacity building, and development of an online learning platform, amongst other things.
3	Ceesolar Energy Ltd	Ceesolar Energy Ltd is the project consultant for the EEP Phase II project. As the consultant, the renewable energy firm handled the project management, capacity building, development of the e-learning platform, and effective documentation of the project. Ceesolar also had the responsibility of interfacing between the beneficiary institutions and the REA during the execution of the project, to ensure reviews, feedback and areas for improvement were well documented. The consultant put together a team comprising a project manager, team lead, educators, safeguard specialist/HSE personnel, software developer, and document control officer. The members of this team worked collaboratively to meet the deliverables of the project.

4	Beneficiary Institutions	The beneficiary institutions are equally key stakeholders in this project. These are the 7 federal universities that were identified and carefully selected by the REA, putting into consideration a fair spread across the 6 geo-political zones in Nigeria. These institutions, amongst other things, had the responsibility of supporting both the project initiators and executors for a successful implementation of the project. Such support was key during the selection process, development of appropriate schedules for the courses, and getting the buy-in and cooperation of the students. The institutions also had the responsibility of cooperating with the consultant at the completion of the project, to ensure proper documentation and reporting.

2.3 Approach and Methodology

The following was the methodology used to implement the different phases of capacity building for selected students:

1. | Development of Curriculum

- A robust, suitable, and relevant curriculum for the training were developed, putting into considerations the latest trends in the industry.

- The curriculum focused on foundational courses in renewable energy and other related aspects in the industry.

- A team of experts, with requisite knowledge in the industry were involved in the development of this curriculum, with support from the project manager.

- The curriculum was further reviewed by an independent renewable energy professional, to ensure its valuable and relevant.

2. | Development of Online Learning Platform

- A state-of-the-art, and east to use online learning platform was developed, and pre-installed with the learning modules.

- The online learning platform is called the EEP STEM Internship Program App (EEP SIPA).

- Some of the features of this bespoke online tool are:
  a. API Integration
  b. Personalization
  c. Centralized & Blended Learning
  d. Data Tracking & Evaluation
  e. Scalability, etc.

3. | Student Selection Process

- A fair and thorough selection process was initiated and conducted in the schools, to ensure the right students are picked for the Program.

- The selection process followed the following steps outlined below:
  1. Awareness and Registration
  2. Virtual Interview
  3. Final Selection

4. | Training and Capacity Building

- A team of highly skilled experts in the renewable energy industry were deployed to deliver the training curriculum to the selected students.

- The capacity building exercise encompassed the following:
  a. Foundational Classes
    » Twelve modules that consist of basic knowledge around the renewable energy sector.
  b. Practical Sessions
    » Hands-on experience in solar system design, construction, and installation.
  c. Performance Assessment
    » Participants would be assessed on their attendance, participation, and contribution, during the Program.

5. | Reporting

- Series of reports were provided at relevant stages of the project, for proper documentation and verification of adherence to set methodology, expected impact, and results.

- The reports that were provided are as follows:
  a. Inception Report
  b. Curriculum and Online Platform Development Report
  c. Student Selection Report
  d. Training Delivery Report
  e. Project Completion Report

6. | Post-Internship Opportunities

- The exceptional students during the course of the program will be provided with post-internship opportunities.

- Such opportunities would include, but not limited to:
  a. Mentorship
  b. Job Placements
  c. Internships
  d. Referrals

2.4 Risks and Mitigation Strategies

As with every project, possible risks were identified beforehand, and mitigation strategies were developed to better manage, limit, or completely avoid such risks. These are itemized in the table below:

Table 2: Risks and Mitigation

S/No.	Possible Risks	Mitigations
1	Lack of sufficient interest level of participants	Conduct a thorough selection process before the commencement of the training, with relevant support from the school management, to ensure the right fits are selected as participants.
2	Neglect of training exercise by participants before completion (Abscondment)	Provide milestones during the exercise, and incentives for each completed milestone. Some of these are; access to the e-learning platform, being a beneficiary of the learning tool provided, getting a completion certification, access to personal mentorship, etc.
3	Regular learning schedule conflicting with the training schedule	The initial engagement with each school management would involve understanding the current schedule of the participants and developing a suitable day and time for training, unique to each institution.
4	Access to an internet connection for e-learning	It is understood that the strength of internet connection would vary from one location to the other, hence, provisions would be made for a central internet connection, one that is the best for a particular location, and provide data for individual students.
5	Health and safety concerns	An integral member of the team is a safeguard specialist/HSE personnel, who would ensure any unforeseen health and safety risks are anticipated, forestalled, or addressed, as the case may be.

2.5   Project Resources

For a successful implementation of this project, several resources both in terms of tools and personnel were necessary. These were carefully researched and selected, with the belief that they would contribute immensely to the excellent delivery of the project. These are as follows:

2.5.1 Tools

2.5.1.1 Tablets and Learning Materials

Students were provided with tablets and other learning materials such as a book, pen and tote bag, for this training exercise. This tablet aided learning via the e-learning platform, and also seamless use of the design applications. A total of 140 units of tablets were provided to 20 students in each of the seven institutions.

2.5.1.2 EEP STEM Internship Program App (EEP SIPA)

The EEP STEM Internship Program App (EEP SIPA) was the No. 1 mode of training and learning. The educators used the tool to prepare and deliver courses and assess the students.

2.5.1.3 Personnel Protective Equipment (PPE)

A set of personnel protective equipment consisting of safety boots, safety hats and safety vest were provided to each of the benefiting students. The PPEs were branded with the name of the program and its sponsors.

2.5.1.4 Helioscope

Helioscope is a solar software platform, used for designing, simulating, and analysing solar energy systems. It features a 3D design engine, energy yield simulation, a detailed financial calculator, and a drag-and-drop solar proposal editor.

2.5.2 Personnel

The quality of an executed project is only as good as the team of executors; hence, the capacity building and training services were conducted by experienced experts in the renewable energy industry, with the project manager having over 10 years of experience conducting similar tasks.

2.5.2.1 The Project Manager

The project manager oversaw the success of the entire project, managing all team members and accessing expected key performance indicators (KPI). The project manager has over 10 years of experience and was tasked with the responsibility of liaising with the PMU of NEP and providing reports.

2.5.2.2 The Project Team Lead

The team lead oversaw the functionality of a workgroup by providing guidance and instruction. The team leader worked closely with the educators and developed strategies to execute all project deliverables properly.

2.5.2.3 Educators (7No.)

The educators are renewable energy engineers with experience in developing and constructing solar systems. The educators channelled the knowledge and experiences from the field to the classroom by providing capacity-building and training for the STEM students.

2.5.2.4 Software Developer

The software developer was responsible for the development and management of the software tool used for capacity building and training. The software developer managed the functionality of the educator app, which served as an

integral part of the capacity-building and training program.

2.5.2.5 Safeguard Specialist – Health and Safety

The safeguard specialist is an experienced health and safety personnel, who structured all activities within the project to meet the organization's OHS policy and clients' HSE expectations.

2.5.2.6 Document Control Officer

The document control officer ensured all documentation met formal requirements and required standards. Key responsibilities involved sorting, storing and retrieving all project-related documents in electronic and hard copies and producing document progress reports for the team lead and project manager to review.

03 Curriculum and Learning Management System (LMS)

3.1 Development of Training Curriculum

The training curriculum for the EEP STEM internship program was developed by a team of expert professionals in the renewable energy industry with experiences in solar PV installation and capacity building.

In the development of the curriculum, the team of experts took into consideration the nature of the program; it being a foundational training for female STEM students on the technical and non-technical disciplines of renewable energy.

A team of STEM and non-STEM discipline experts in the renewable energy industry provided inputs in the development of the curriculum.

3.1.1 Approach

The development of a course curriculum on renewable energy for this program required a systematic approach that combined instructional design principles, subject matter expertise, and educational goals.

Here is the approach and methodology for developing the comprehensive course curriculum on renewable energy:

1. Needs Assessment:
A needs assessment was conducted during the selection process, to properly understand the target audience's knowledge levels, learning goals, and prior experience with renewable energy. This enabled the identification of the specific topics and subtopics within renewable energy that need to be covered in the course.

2. Define Learning Objectives:
The learning objectives for the course were clearly defined and the following question was asked: "What should learners be able to know, do, or understand after completing the course?"; this guided course content creation.

3. Content Planning:
The curriculum was structured and organized into modules based on the identified topics. The main content for each module was outlined, including key concepts, theories, practical examples, and case studies.

4. Instructional Design:
An instructional training guide and course outline were designed to include module titles, learning objectives, and a breakdown of topics. Instructional strategies agreed upon to be explored are lectures, discussions, hands-on activities, and simulations.

5. Content Creation:
Content in PDF, PowerPoint slides and video presentations were developed using extensively researched resource materials.

6. Assessment and Evaluation:
Assessment methods were designed to align with the learning objectives; hence, the assessments are mostly fun quizzes, assignments, and final assessments.

7. Case Studies and Industry Examples:
The training session included real-world case studies and examples that showcase successful implementations of renewable energy technologies.

8. Alignment with Standards:
In developing the training content, the alignment with industry standards and regulations was ensured. A cue was taken from the GIZ standard training on renewable energy.

3.1.2 Course Content
3.1.2.1 Overview

The training course title is; "Introduction to the Fundamentals of Renewable

Energy". This course provided a foundational understanding of renewable energy across many relevant modules. The training curriculum consists of 12 modules, namely;

1. Introduction to Energy Fundamentals.
2. Basics of Electricity
3. Introduction to Solar Energy
4. Solar Energy in Nigeria-Application & Resources
5. Basics of Solar System Sizing
6. Introduction to Tools & Equipment for Solar Installation
7. Introduction to Solar PV System Installation
8. Introduction to Maintenance and Troubleshooting of Solar PV System
9. Introduction to Health, Safety, & Environment
10. Introduction to Energy Efficiency Management
11. Introduction to Supply Chain Management
12. The Roadmap to Energy Transition

The breakdown of the course by modules, topics, learning outcomes, and duration for training is shown in the table below:

Table 3: Breakdown of Course Content

No.	Title of Module	Topics	Learning Outcomes	Delivery Timeline
1	Introduction to Energy Fundamentals	Introduction to Energy Types and Forms of Energy Sources of Energy	Have a full understanding of Energy. Know the applications of Energy in everyday life. Understand the difference between renewable and non-renewable energy.	1 Week
2	Basics of Electricity	Introduction to Electricity? Basic Electrical Terminologies Understanding Ohm's Law Electrical Symbols	Have a clear understanding of electricity. Know the basics of how Electricity works. Understand the behaviour of electric charges and electric circuits. Identify different electrical symbols and what they stand for.	1 Week
3	Introduction to Solar Energy	Introduction to Solar Energy Components of Solar Energy System	Know what solar energy is all about. Know the components of a solar energy system. Know the uses of each component.	1 Week
4	Solar Energy in Nigeria – Applications & Resources	Applications of Solar Energy Systems Solar Resources in Nigeria	Understand the different applications of solar PV. Have a sense of the solar resources and potential in Nigeria.	1 Week

5	Basics of Solar System Sizing	Introduction to Energy Audit Electrical Loads and Types Load Optimization Sizing an Off-Grid Energy System	Understand the concept of energy audit. Know the importance of energy audits for system sizing. Have a sense of load optimization in sizing. Have a basic knowledge of how to size an off-grid energy system.	1 Week
6	Introduction to Tools & Equipment for Solar Installation	Key Measurements in Solar PV Installation Tools & Equipment for Installation	Know the key measurements to take when carrying out solar PV installation. Identify different tools and equipment that are used for installation. Know the use of each tool/equipment for solar PV installation	1 Week
7	Introduction to Solar PV System Installation	Mounting Structures Schedule of Activities for Solar System Installation Solar PV Installation Guide Cabling & Wiring in Solar Systems Effects of Shading on Solar PV Installation	Know what mounting structures are, and their usage. Understand how to connect wires/cables in solar systems. Know the step-by-step process for Solar PV installation. Know what shading is, and its effects on Solar Systems.	1 Week
8	Introduction to Maintenance & Troubleshooting of Solar PV Systems	Maintenance of Solar Systems Troubleshooting of Solar Systems	Understand the concept of maintenance in solar systems. Know all the processes to take in maintaining a solar energy system. Know how to troubleshoot a solar energy system.	1 Week
9	Introduction to Health, Safety and Environment	Introduction to Health & Safety Electrical Hazards Safety Symbols Understanding Fire Extinguishers Personal Protective Equipment (PPE)	Understand the concept of health and safety. Identify safety symbols and what they all stand for. Get an understanding of how fire extinguishers work and how to use them. Know the different types of PPE, and how/where to use them.	1 Week

10	Introduction to Energy Efficiency Management	Introduction to Energy Efficiency Management Applications of Energy Management Energy Conservation Tips	Understand the key concept of energy efficiency management. Know the various applications of energy management. Know some of the energy conservation tips for homes and businesses.	1 Week
11	Introduction to Supply Chain Management	Introduction to Supply Chain Management Importance of Supply Chain Management Supply Chain Management in Nigeria	Understand the concept of supply chain management. Know the key elements of supply chain management. Know why supply chain management is important. Understand the challenges of supply chain management.	1 Week
12	Roadmap to Energy Transition	Overview of Renewable Energy Transition Nigeria's Roadmap to Renewable Energy Transition Policies to Implement for Effective Energy Transitioning	Know the concept of renewable energy transition. Understand why energy management is key to transitioning. Get the process involved in transitioning to renewable energy.	1 Week

3.1.2.2 Content

The course developed was delivered through the online learning management system platform by the individual educators. To ensure a smooth delivery of the course the course content was uploaded on the platform in the following formats;

1.   PowerPoint Presentation
2.   PDF Document
3.   Video Presentation
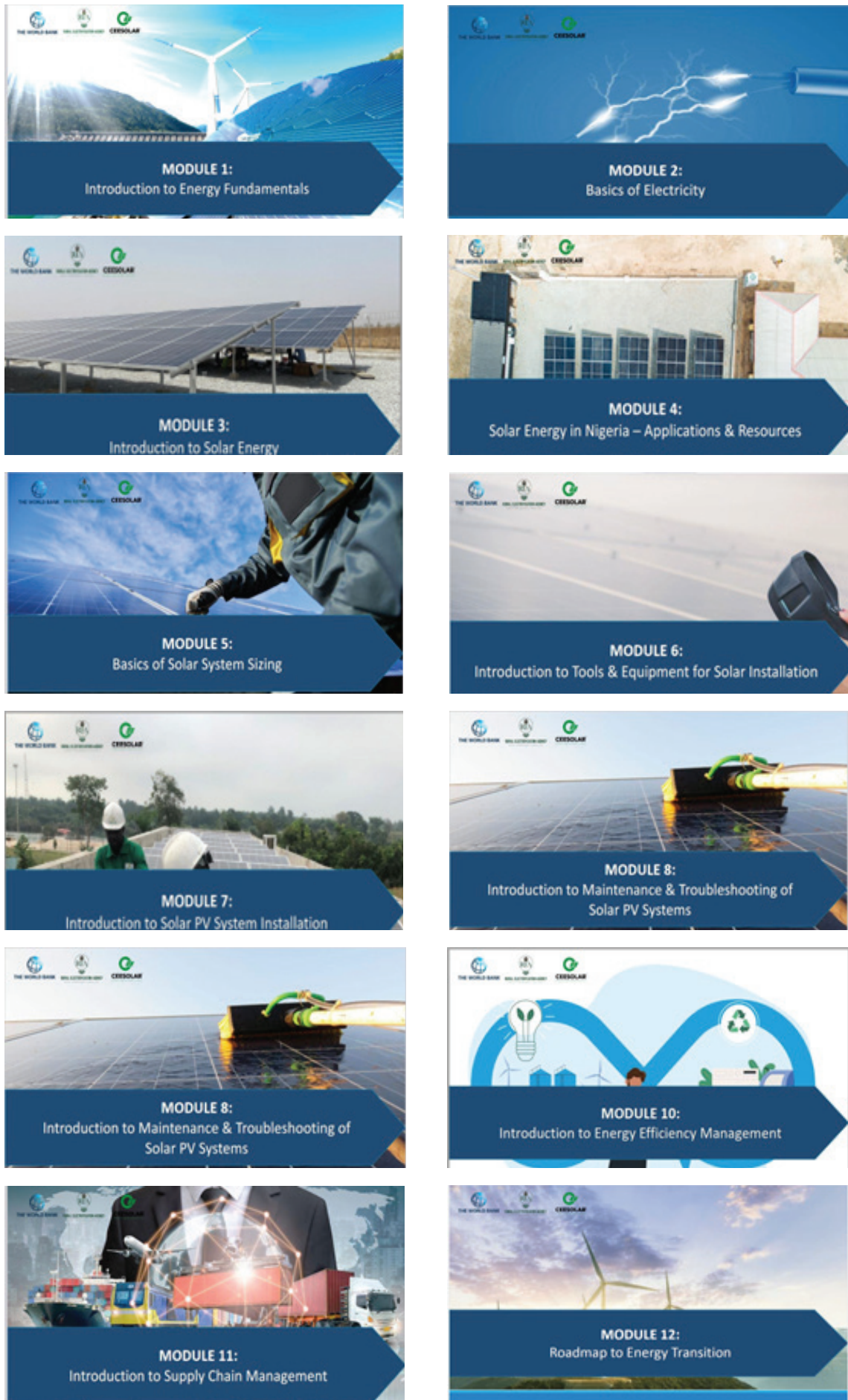
Figure 8: Front Pages of the Modules on the Fundamentals of Renewable Energy on the LMS

3.2 Development of Learning Management System (LMS)

The main medium of delivery of the training and capacity building for the EEP STEM Internship Program Phase II was an online learning platform. A bespoke learning management software was developed specifically to meet the needs of this program.
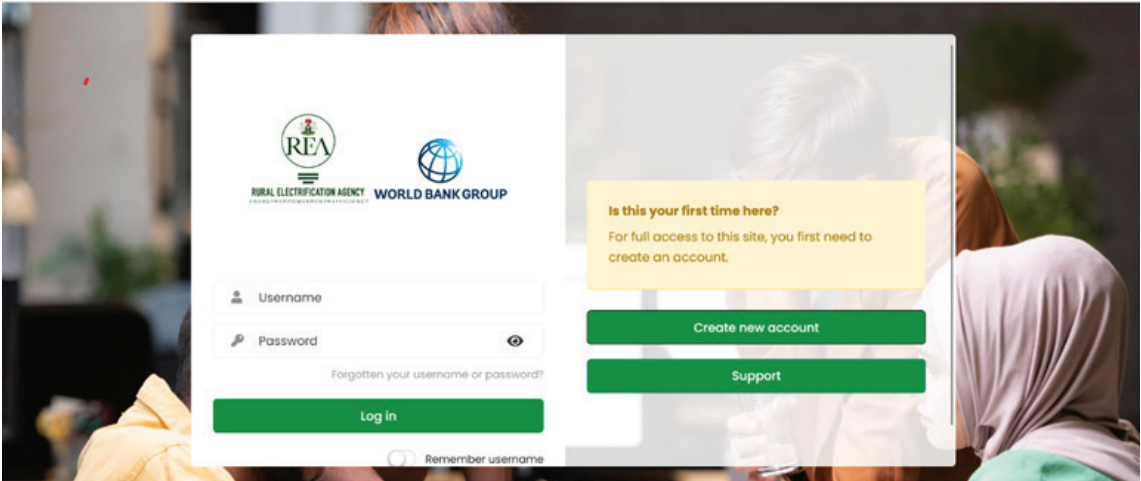
Figure 9: Log-In Page of The Online Learning Management System
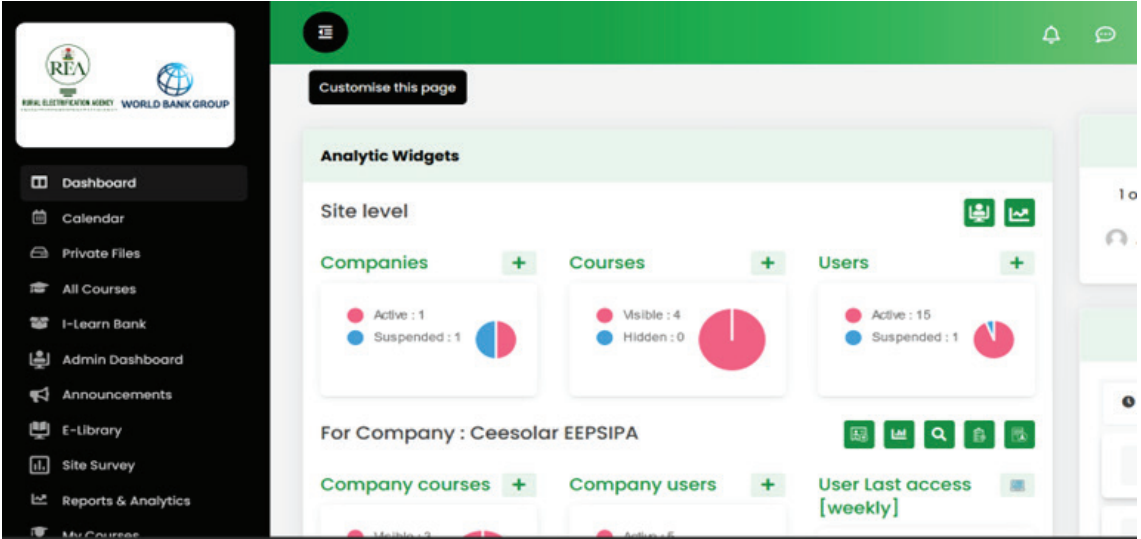
Figure 10: Dashboard of the Online Learning Management System

The EEP STEM Internship Program App (EEP SIPA) https://ceesolareepsipa.melimu is a robust learning management tool developed for the smooth delivery of training and capacity building.

3.2.1 Objectives

The objectives for the development of the Online Learning Platform are shown below:
1. Accessibility: Ensure that training is accessible to a wider audience, regardless of geographical location, physical disabilities, or time constraints.
2. Flexibility: Provide a flexible learning environment that allows learners to study at their own pace, on their schedule, and from any location.
3. Scalability: Design a platform that can accommodate a large number of users and courses as the user base grows over time.
4. Diverse Course Offerings: Offer a diverse range of courses and subjects to cater to various interests and learning needs.
5. Interactivity: Create interactive learning experiences that engage learners through multimedia, quizzes, assignments, discussions, and other interactive elements.
6. Personalization: Implement features that allow learners to customize their learning paths based on their interests, skill levels, and goals.
7. Collaboration: Facilitate collaboration among learners through discussion forums, group projects, and peer-to-peer interactions.
8. Assessment and Feedback: Provide effective assessment tools to evaluate learners' progress and provide timely feedback on assignments and quizzes.
9. Engagement and Motivation: Design the platform to keep learners motivated and engaged, incorporating gamification, progress tracking, and rewards.
10. Analytics and Reporting: Develop a system to collect and analyse data on user behaviour, course completion rates, and other metrics to make data-driven improvements.
11. Quality Content Delivery: Ensure that high-quality educational content is presented effectively, including videos, presentations, readings, and other materials.
12. Security and Privacy: Prioritize the security of user data, including personal information and course progress, and ensure compliance with relevant privacy regulations.
13. Integration: Integrate the platform with other educational tools and systems, such as learning management systems (LMS), content management systems (CMS), and communication tools.
14. Innovation: Stay up-to-date with emerging technologies and educational trends to continuously innovate and provide cutting-edge learning experiences.
15. Certification and Credentials: Offer certificates or credentials upon successful course completion, providing learners with tangible proof of their achievements.

3.2.2 Base LMS Setup

The e-learning platform or learning management system (LMS) has been developed, to provide the perk of hosting by the participants, giving a relatively simple, online, plug-and-play platform to create the learning academy.

3.2.3 Key Features of the EEP SIPA

The EEP SIPA was developed to consist of the following notable features to aid the learning of the students.

1. API Integration Capabilities
An Application Programming Interface (API) allows the EEP SIPA to integrate a wide range of third-party applications.

This ensures that the centralized LMS accesses other applications using Single Sign-On (SSO).

The Zoom app was integrated with the EEP SIPA to enable virtual sessions with the educators.

2. Data Tracking

The application was designed to allow the administrators and educators to track the progress of the students undergoing the training through the platform. The students' progress on the course taken could be stored as well as their responses to the quizzes.

3. Personalization

The software was designed and personalized with the logos and brand colours of the program sponsors (REA and World Bank) and consultants (Ceesolar).

4. Accessibility and Centralized Learning

The EEP SIPA can be accessed from any smart device. Students without a functioning laptop could access the training via their phones or tablets. Hence, students could study at any suitable time, stay on track and not get lost.

5. Usability/Blended Learning

Blended learning offers better learning opportunities that meet learners' specific needs.

Blended learning brings eLearning and classroom learning together in a flexible way using an LMS. It allows teachers and learners to make use of the latest in learning technology to properly organize the course structure, enables Interactive learning, and enables sharing experiences between coursemates and educators by accessing the high-quality course material, assignments, and course.

The platform also enables gamification to enhance fun learning. Students and corporate learners could learn using this gamified platform while earning rewards through badges, leaderboards, certifications, course credits, etc. The interactive learning platform engages learners and offers them a better learning experience.

6. Evaluation of Student Performance

Student performances were evaluated through quizzes, tests, assignments, attendance or exams directly from the platform.

7. Scalability

The software is currently designed to host the data of 150 users for the program but is scalable as deemed fit.

8. Offline Learning Trackers

Students were able to take lessons offline and be assured of the tracking of their progress. Immediately after the device is reconnected, the data is refreshed showing the current status report. Hence, offline progress is not lost.

9. Automated Alerts and Notifications

It enables auto-alerts to learners about their training deadlines while notifying trainers of a user's completion rates.

10. Smart Scheduling Tools

Enables smart scheduling tools where Educators can offer their learners multiple dates and times for their training sessions.

11. Hosting Options for Maximum Security

Enables data security protocols set up to ensure the safety of sensitive information.

3.2.4 Structure of EEP SIPA

The EEP SIPA was developed using multiple code bases stored in a secured and dedicated server. The code base

was managed by the software engineer for the entirety of the project.

Two main components that enable the functionality of the software application are
• Cloud Storage
• Data Security

3.2.5 LMS Configurations and Testing

Developing an LMS is a multidisciplinary effort that requires collaboration among instructional designers, developers, UI/UX designers, testers, and project managers.

It was important to maintain open communication with stakeholders throughout the development process to ensure the final product meets their expectations and serves the learning community effectively.

3.3 Learning Management System (LMS) Rollout Steps

Following the completion of testing, the rollout of the LMS followed the steps as shown below;

Table 4: LMS Rollout Steps

No.	Activity	Details	Status
1	Admin Training on Staging LMS	The Company Administrator(s) are trained by the software developer on the functionality of the software and how to stage it for training	Completed
2	Training of Educators on the	The Educators are trained on the functionality of the software and its application for this program	Completed
3	Upload of Course Content	Course content developed is uploaded to the LMS platform	Completed
4	User Acceptance Testing (UAT):	Involve actual users in testing to ensure the LMS meets their needs and expectations. Gather feedback and make necessary adjustments.	Completed
5	Onboarding of student Users on the Platforms	140 students are to be onboarded for training. The onboarding would contain training on how to use the platform.	The onboarding commenced immediately after the approval of the completion of the student selection and course curriculum development
6	Transfer of Ownership of EEP SIPA	The LMS platform would be transferred to REA as earlier agreed in the TOR	Ongoing

04
Student
Selection
Process

4.1   Shortlisted Beneficiaries

The beneficiaries of this program are selected students from a shortlist of STEM students in 7 federal institutions in Nigeria. The NEP team, after their due diligence, received a shortlist of qualified students from each of the institutions, and this list was shared with the project implementer; Ceesolar.

The total number of shortlisted students per institution is indicated in the table below:

Table 5: Shortlisted Students

S/No.	Name of Institution	No. of Shortlisted Students
1	Federal University of Agriculture, Abeokuta (FUNAAB)	50
2	Federal University, Gashua (FUGA)	39
3	Nigeria Defence Academy (NDA)	25
4	Michael Okpara University of Agriculture	50
5	University of Abuja (UNIABUJA)	50
6	University of Calabar and Teaching Hospital (UNICAL)	40
7	University of Maiduguri and Teaching Hospital (UNIMAID)	35
	TOTAL	289

The shortlisted students were passed through a selection process, to get the final 20 students for the program. But first, there was a mock selection process carried out in-house, to ensure the main process was a smooth and effective one.

4.2   Approach
4.2.1   Mock Selection Process
4.2.1.1 Overview

The first week of the student selection process was used for a mock exercise of the actual process. The importance of a mock process is to properly plan the exercise to have a full picture of the entire process, the challenges that might arise, and the measures towards mitigating such challenges.

For this process, there were mock GBV representatives in-house for two (2) institutions and also shortlisted mock students to represent each institution in-house. These institutions are; the University of Abuja, and Federal University, Gashua (FUGA). Eight (8) mock students were shortlisted under each institution, making up a total of 16 mock students partaking in the exercise.

The 16 mock students were passed through the selection process, which had the following steps:

• Awareness & Registration
• Online Assessment (CBT & Essay)
• Virtual Interview

The awareness and registration stage had a 100% completion rate from both schools. The online assessment stage had 13 responses out of 16, which was an 80% completion rate. 8 of the 13 mock students passed the assessment and moved on to the final stage of selection; virtual interview. Of the 8 students, 5 showed up for the interview,

and 4 were finally selected, based on the set marking guide. This came down to 2 students per institution.

Hence, it was clear that out of the shortlisted 8 students, 2 made it to the final stage (25%).

This mock selection process lasted for a week.

4.2.2 Challenges, Lessons Learnt & Recommendations

The mock selection process aimed to test the set selection process and see the success rate. Also, this was to enable the understanding of what works, and what doesn't and make necessary adjustments. Consequently, here are the lessons learnt:

1. The low number of selected students at the end of the process showed that there was a sharp decline from the assessment stage. Hence, there was an obvious need to simplify the selection process. The main selection process was thereafter compressed into the following:

   a. Awareness & Registration
   b. Virtual Interview (Personal Statement)

2. During the virtual interview, there was a challenge with internet connectivity and network strength. This posed a significant challenge to the speed and efficiency of the process. Hence, it was observed that an alternative virtual interview medium would be preferred, and a phone call was decided as an alternative for this process.

4.2.3 Engagement with GBV & School Reps

After completion of the mock student selection process, there was an engagement with the GBV and school representatives. This thorough engagement aimed to ensure there is support and cooperation from these stakeholders to ensure proper awareness among the students before the kick-off of the selection process.

A considerable period was granted to these representatives to carry out this awareness and provide a soft landing when the main process starts. This engagement lasted for 1 week.

4.2.4 Selection Process

The process of selecting the final 20 students from each institution involved a rigorous approach to select the most qualified and interested from the shortlisted students. The level of interest to participate in the program, and the relevant resources and technical know-how to fully benefit from the program were considered.

A simple, yet effective 2-step process was deployed for the student selection, namely; the registration stage and virtual interview stage, as shown in the chart below;
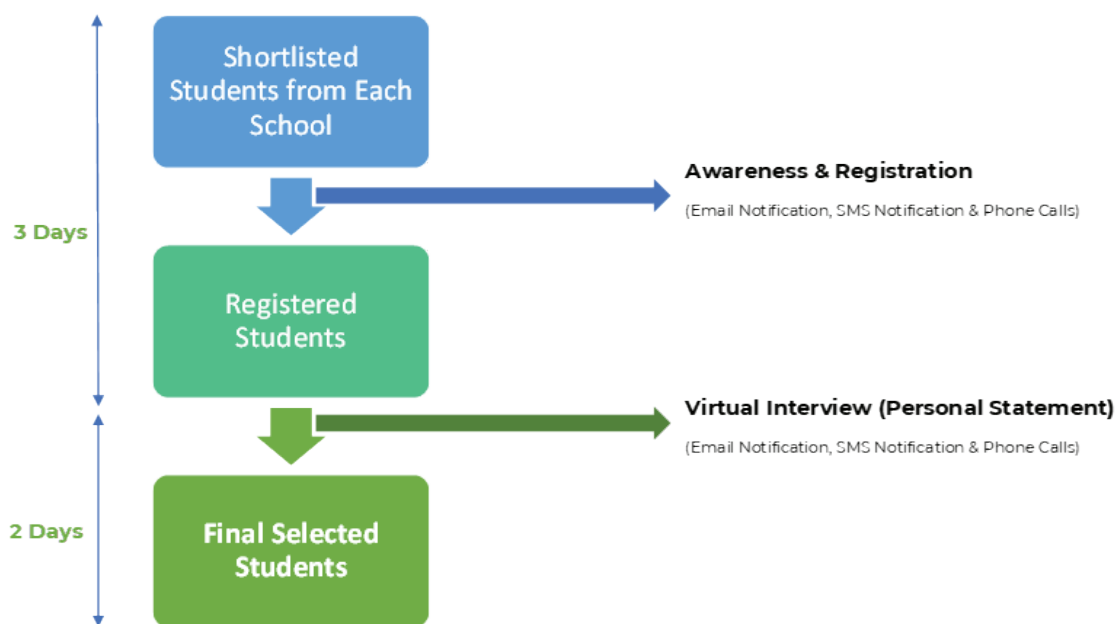
Figure 11: The Student Selection Process

4.2.5 Awareness and Registration Stage

The first stage of the student selection process was an awareness and student registration stage. This stage aimed to provide sufficient relevant information about the training program to all shortlisted students. Additionally, the students were required to register their interest in the program, to ensure only those who are passionate and genuinely interested in the training stand the chance for selection.

In order to ensure a seamless process, the GBV representative, and contact person in each school were carried along, and their support was leveraged in communicating with the students and validating the authenticity of the program.

For the collection of data, a Google form was created for student registration. This form requested the students to

provide the following information:

- Email Address
- Full Name
- Name of Institution
- Department
- Level
- Phone Number
- Prior Knowledge About Renewable Energy
- Level of Computer Literacy
- Level of Interest (Scale of 1-5)
- Level of Experience with Online Courses
- Expectations from the Training

Three levels of communication were deployed for this awareness/ registration stage, to ensure all students are reached, and everyone is given a fair chance to indicate their interest in the program.

The awareness and registration lasted for 3 days.

4.2.6 Virtual Interview Stage

The next and final stage of the student selection process was a virtual interview. The aim of this stage in the process was to select the final 20 students from the valid registrations obtained in the previous stage. This interview was conducted via a phone call with each of the registered students and lasted for a maximum of 5 minutes.

4.2.6.1 Notification of Virtual Interview

The first action for this stage was to notify the students of a scheduled virtual interview. This notification was communicated via Email and SMS. The GBV representative in each school was also notified, to ensure support and compliance for this stage. The notification Emails & and text messages also communicated the period during which the interviews would be conducted, the duration of each session, and the aim of the interview.

4.2.6.2 Virtual Interview – Phone Call

The virtual interview was conducted via a phone call to the registered students. This option was preferred due to simplicity and in order to ensure the challenge of internet connectivity does not impede the success of the exercise (a lesson from the mock process).

During the phone call interview, which lasted for a maximum of 5 minutes, the following were discussed:

- Introduction – Student's Name, Institution, Department, and Level (to ensure there are no disparities).
- Brief Overview of Program
- Personal Statement - Why They Should Be Selected as One of the Final 20 Students
- Questions & Answers

This approach ensured that the recipients of the phone call were the actual students on the registration list, and also gave them another opportunity to hear a brief overview of the project. Additionally, the students had the opportunity to convince the team as to why they deserve a spot in the final list of students to be enrolled in this program.

The interview process lasted for two (2) days, with the University of Maiduguri, University of Calabar, and Michael Okpara University completed on the 1st day, while the University of Abuja, Federal University, Gashua and Federal University of Agriculture, Abeokuta (FUNAAB) completed the 2nd day.

Efforts were made to ensure all valid registered students were contacted and allowed to partake in the phone call interview. Numbers that were unreachable and/or switched off were called back after some time, and the support of their school GBV representatives was leveraged during the process, when necessary.

Figure 12: A Picture of Ceesolar's Project Team Members During a Phone Call Session

4.2.7 Final Selection Assessment Criteria

After the virtual interview process, it was time to select the final 20 students for the NEP EEP Phase II Female Stem Internship Program. This final selection involved a review of the responses received during the phone call, and assessing the level of passion and interest in the program. The level of interest, commitment to the program and availability filled on the registration form were also considered in the final assessment.

The scoring guide for this final assessment is shown below:

Figure 13: Assessment Criteria

Assessment Area	Score
Personal Statement (Interview)	10
Availability	5
Interest Level	5
TOTAL	**20**

4.3 Selected Students

The selection was done on the final day of the selection process, and the final list of students selected is shown below:

Table 6: FUNAAB Selected Students

1. Federal University of Agriculture, Abeokuta (FUNAAB)					
2					
School Contact Person: Engr. Akinyele Olawole (08033561491)					
School GBV Representative: Faridah M. Adepetan (09168349520)					
S/N	Name of Student	Department	Level	P/No.	Email Address
1	Adebobuyi Damilola Priscilla	Soil Science & Land Management	400	08163367764	adebobuyidamilola01@gmail.com
2	Adegbesan Oluwatimileyin Tawakalt	Civil Engineering	400	09063458049	adepejutimi10@gmail.com
3	Adegoke Adedoyin Anthonia	Statistics	400	08148623286	adegoke.adedoyinanthonia@gmail.com
4	Adesanya Rhoda Arinade	Agricultural & Bio Resources Engineering	300	08142494568	rhodaadesanya27@gmail.com
5	Agboyinu Gladness Nuesekan	Food Science & Technology	400	08135517475	agboyinugladness@gmail.com
6	Ajayi Joan Temitope	Computer Science	300	08101078933	joanajayi5@gmail.com
7	Badmus Yetunde Olamide	Soil Science & Land Management	300	09039015072	holuwanifemi720@gmail.com
8	Hamzat Ayomide Waliyat	Food Science & Technology	300	08068071763	hamzatayomide75@gmail.com
9	Itua Uyiosenobua Busayo	Environmental Management & Toxicology	400	07059720667	uyiosenobua@gmail.com
10	Matthew Victoria Akachi	Chemistry	400	08083483198	matthewvictoria99@gmail.com
11	Ojelade Temitayo Elizabeth	Physics	300	09032866997	temitayoojelade@gmail.com

12	Ola Busola Elizabeth	Animal Nutrition	400	07065947918	olaelizabeth2018@gmail.com
13	Oloyede Damilola Oluwaseun	Mathematics	300	08160483161	oloyededamilola05@gmail.com
14	Olorunnishola Taiwo Oluwadamilola	Electrical And Electronics Engineering	400	08143886599	teedamilola71@gmail.com
15	Onwuzuruike Amarachi Favour	Pure And Applied Botany	400	09074888172	fdivine376@gmail.com
16	Olatunde Fatimo Olaitan	Horticulture	300	07039270633	olatundefo.19@student.funaab.edu.ng
17	Oyelese Esther Simisolaoluwa	Plant Physiology & Crop Production	300	07010433443	oyelesesimisola@gmail.com
18	Salami Elizabeth Motunrayo	Mechanical Engineering	300	08089268450	salamielizabeth2019@gmail.com
19	Sholanke Olamide Comfort	Home Science & Management	400	09060327034	sholankeolamide2018@gmail.com
20	Ukachi Esther Uloma	AERD	300	08103970010	ulomapius@gmail.com

Table 7: FUGA Selected Students

	**3. Federal University, Gashua (FUGA)**
	School Contact Person: Engr. Isa. S. Ibrahim (08024385085)
	School GBV Representative: Mildred Garba (08066971136)
S/N	Name of Students	Department	Level	P/No.	Email Address
1	Abdulkarim Halima Dakasku	Chemistry	300	08167292019	halimadakasku88@gmail.com
2	Ahmed Basimah Alhassan	Chemistry	200	08032163414	ahmedbasimah@gmail.com
3	Ahmed Rabiatu	Chemistry	300	08169827359	rabiatuahmed08@gmail.com
4	Alex Lydia	Chemistry	300	08100449007	lydiaalex646@gmail.com
5	Ali Rukayya Baba	Chemistry	200	08020926835	rukayyaalibaba35@gmail.com
6	Fatima Umar Kaigama	Computer Science	200	08086468542	umarkaigamaf@gmail.com
7	Hauwa Garba Hassan	Physics	100	09127556132	maijiddabirniwa@gmail.com
8	Hyelhira Amos	Chemistry	300	07015587423	Hyelhiraamos@gmail.com
9	Ibrahim Zainab Mainasara	Chemistry	200	08034552276	zainabmainasara389@gmail.com
10	James Naomi	Chemistry	200	09030269896	naomijamesgaladima@gmail.com
11	Maimuna Mohammed	Mathematics	100	07042904781	maimunamohammed0704@gmail.com
12	Maina Ladi	Computer Science	200	07063334110	ladimaina7@gmail.com
13	Maryamu Isaac	Computer Science	200	08142422722	isaacmaryamu@gmail.com
14	Muhammad Harira Jamo	Chemistry	200	08147861769	hariramuhammadjamo@gmail.com
15	Muhammad Kk Hauwa	Chemistry Department	200	08131593943	hauwamuhammadkeke@gmail.com
16	Paul Cynthia	Chemistry	300	09069403927	paulcynthia2019@gmail.com

17	Salisu Maryam Dalah	Computer Science	300	07068134554	maryamsalisudalah51@gmail.com
18	Simon Favour	Computer Science	300	08069913832	Favoursimonsara@gmail.com
19	Usman Jamima	Chemistry	200	07081552007 09164391151	jamimausman11@gmail.com
20	Yohanna Saratu	Computer Science	300	08100070902	saratuyohanna528@gmail.com

Table 8: MOUAU Selected Students

4. Michael Okpara University of Agriculture (MOUOA)					
School Contact Person: Prof. Udo Herbert (08138826062)					
School GBV Representative: Mrs. Obioji Kosy Chinemerem (09022023593)					
S/N	Name of Students	Department	Level	P/No.	Email Address
1	Agba Obianuju Blessing	Biochemistry	300	07088951519	aob.blessing@gmail.com
2	Agbaegbu Blessing Chisom	Computer Engineering	300	09034546751	agbaegbuchisom@gmail.com
3	Agbor Precious James	Animal Science	300	07032597956	preciousjamesagbor@gmail.com
4	Azih Onyinyechi Glory	Hospitality Management & Tourism	400	08132101918	azihonyinyechi@gmail.com
5	Egbo Dorathy Ukamaka	Food Science & Technology	200	08103004233	amakaegbo82@gmail.com
6	Enyiazu Miracle Chidinma	Soil Science & Land Resource Management	300	08166549383	miracleenyiazu@gmail.com
7	Ernest Nancy Uzochi	Microbiology	200	08134664925	ernestnancy02@gmail.com
8	Godwin Mercy Onyinyechi	Agricultural & Bioresource Engineering	300	08139750714	merccy.godwin@gmail.com
9	Israel Sopuruchi Queen	Soil Science & Meteorology	300	08103901122	israelsopuruchi18@gmail.com
10	Israel Victory Eberechi	Chemical Engineering	400	08162919639	veeafonne7@gmail.com

11	Kelvin Nmesoma Goodness	Microbiology	200	07025857152	kelgoodness2020@gmail.com
12	Nwamuo Lois Eberejah	Food Science & Technology	400	08108457190	humphreylois7@gmail.com
13	Nwaru Favour Mmesonmachi	Biochemistry	200	09078479769	favournwaru@gmail.com
14	Okafor Oluomachi Gloria	Human Nutrition & Dietetics	200	09035921301	gloriaokafor78@gmail.com
15	Okorie Oluebube Miracle	Computer Science	300	09067751211	okorieoluebubemiracle@gmail.com
16	Okoroafor Precious Nnenna	Environmental Management & Toxicology	300	08085957672	okoropreshy15@gmail.com
17	Okoye Onyinye Theresa	Computer Science Education	200	08166915640	maryjaneokoye613@gmail.com
18	Onwe Ijeoma Francisca	Computer Science	400	08145571944	prettynuella2000@gmail.com
19	Orisakwe Chioma Sofia	Physics	200	09162086559	cikechukwu572@gmail.com
20	Ukachi Stella Uchechi	Agricultural Engineering	300	08072418254	annastaciaukachi@gmail.com

Table 9: University of Abuja Selected Students

5. University of Abuja

School Contact Person: Dr. Kafayat Adeyemi (08067156254)

School GBV Representative: Jennifer Sambo (08164930303)

S/N	Name of Students	Department	Level	P/No.	Email Address
1	Abolarin Folashade Josephine	Chemistry	300	08128461185	abolarinfolashade2021@gmail.com
2	Abubakar Jamila Sa'ad	Computer Science	400	08086216141	jameelasaad001@gmail.com
3	Adebayo Tunmise Ifeoluwa	Physics	400	07081109295	adebayoluwatunmishe@gmail.com

4	Alabi Deborah Ayomide	Microbiology	400	09024926349	alabi.deborah2020@uniabuja.edu.ng
5	Anjorin Jennifer Cecilia	Statistics	300	09035505080	anjorinjennifer16@gmail.com
6	Awah Henrietta Uche	Chemical Engineering	300	09072966002	henriettaawah12@gmail.com
7	Edet Paula Itamanwan	Civil Engineering	300	09034225442	paulaedet65@gmail.com
8	Ismail Hikmatullah Abike	Mechanical Engineering	400	08062177921	hakimahisa10@gmail.com
9	James Phebe Oyine	Chemical Engineering	400	08108388168	phoeebejames@gmail.com
10	Kizito Valentina Destiny	Civil Engineering	300	09098603535	vadekivatoblack@gmail.com
11	Muhammed Fatima Omoteniola	Electrical Electronics Engineering	300	09116423617	muhammedfatima1112@gmail.com
12	Muhammed Hamidat Ismail	Civil Engineering	300	08062177921	hamidatmuhammed03@gmail.com
13	Muninga Hauwau Aliyu	Electrical Electronics Engineering	300	09071403430	haliyum911@gmail.com
14	Muse Favour-Chimzurum Folakemi	Microbiology	300	07088756424	favourchimzurum@gmail.com
15	Ofume Lauretta Sunday	Mathematics	300	09017727384	laurettafumez@gmail.com
16	Olaniyan Deborah	Physics	300	08138604562	olaniyan.deborah2020@uniabuja.edu.ng
17	Pam Mary Chuwang	Electrical Electronics Engineering	300	07044402763	marypam122@gmail.com
18	Sadiq Mohammed, Munirat	Microbiology	300	07035683082	sadiq.munirat2020@uniabuja.edu.ng
19	Terna Peace	Physics	400	08142984243	ternapeace2004@gmail.com
20	Tiamiyu Selimot	Chemical Engineering	400	07030169687	tiamiyu.selimot2020@uniabuja.edu.ng

Table 10: University of Calabar Selected Students

6. University of Calabar					
School Contact Person: Engr. Paul Takon (08033416923, 08120493414)					
School GBV Representative: Becky Owolo (09168349519)					
S/N	Name of Students	Department	Level	P/No.	Email Address
1	Akan Mary Kijie	Science Laboratory Technology	300	08105823196	maryakan4@gmail.com
2	Ayambim Joy Ada	Civil Engineering	200	08133632925	joyayambim33@gmail.com
3	BASSEY ANGELA Mlcheal	Health Information Management	200	08168976806	angelabassey1234@gmail.com
4	Bassey, Glory Umoh	Mathematics	200	08168976806	angelabassey1234@gmail.com
5	Dakwan, Favour Kinyua	Public Health	300	09072610227	dakwanfavour@gmail.com
6	Ebeh Flourish Chinecherem	Mathematics	200	08023364962	flourishebeh5454@gmail.com
7	Ekong Christiana Friday	Computer Science	200	07032817351	ekongchristiana200@gmail.com
8	Ekori Goodnews Nenka	Mathematics	200	09165966702	ekori.ekori@yahoo.com
9	Ekpen Abigail Obu	Computer Science	200	07038840480	ekpenabigail@gmail.com
10	Ekpenyong, Comfort Affiong	Health Information Management	200	08061238849	commynine@gmail.com
11	Eriworio Kogiesi Sam	Human Physiology	300	09022419039	kogiesisam@gmail.com
12	Eteng, Martina Lawrence	Chemical Engineering	200	09037817894	etengmartina16@gmail.com
13	Ikade Victoria Agbo	Petroleum Engineering	400	08139063696	ikadevictoria@gmail.com
14	Ogar Rose Banku	Nursing Science	200	08034421816	ogarrosebanku68@gmail.com
15	Ogede Priscilla Lutte	Science Laboratory Technology	200	08129626612	priscillalutte375@gmail.com
16	Okwo Stephanie Osa	Human Physiology	200	07042007890	osastephanie0@gmail.com
17	Osang Deborah Nyiokie	Genetics & Biotechnology	300	09032148149	osangdeborah100@gmail.com

18	Otu, Loveth Nfedytiem	Nursing Science	200	08143976306	love.dytiem@gmail.com
19	Raphael Blessing Chidinma	Computer Science	200	09042654661	raphaelbc2000@gmail.com
20	Udida Gift Anorshiye	Mathematics	300	07061213662	giftudida8@gmail.com

Table 11: UNIMAID Selected Students

7. University of Maiduguri					
School Contact Person: Engr. Mohammed Ibrahim Bello (08065346527)					
School GBV Representative: Walong Garba (08036167975)					
S/N	Name of Students	Department	Level	P/No.	Email Address
1	Abdulrasaq Malikah Olawumi	Mechanical Engineering	200	08122385484	malikahabdulrasaqolawumi @gmail.com
2	Abubakar Hafsat	Mathematical Science	300	09038096721	hafsatabubakarsuleiman @gmail.com
3	Adi Godiya	Physics	300	08141707135	adigodiya9@gmai.com
4	Ahmed Zara	Computer Science	300	08122662087	zaraahmed1226@gmail.com
5	Aisha Baba Muhammad	Food Science & Technology	400	08130138037	aishabmuhammad12122019 @gmail.com
6	Aisha Kabir Abbagana	Computer Engineering	400	07014665441	ninakabir36@gmail.com
7	Atom AISHATU	Electrical & Electronics Engineering	300	07082985618	aishatuatom66@gmail.com
8	Augustine Patience Iliya	Physics	300	08136815827	ptncaugustine@gmail.com
9	Bello Saliha Bawuro	Mathematical Sciences	300	08093582592	salihabello2002@gmail.com

10	Dorcas Gideon	Electrical & Electronics Engineering	400	08168419428	gideondorcas2018@yahoo.com
11	Hauwa Cletus Dawa	Electrical & Electronics Engineering	300	09045526156	hauwacletus68@gmail.com
12	Hauwa Mohammed Rabiu	Mechanical Engineering	300	08143774046	hauwarabiu5050@gmail.com
13	Ibrahim Zainab Umar	Computer Engineering	300	08012438854	xieumar@gmail.com
14	Jauro Aisha Ibrahim	Agricultural & Environmental Engineering	300	08026852668	aishajauro2021@gmail.com
15	Mala Fatima Baba	Chemical Engineering	200	07035396318	fatimababamala007@gmail.com
16	Muhammad Hadiza Abdullahi	Electrical & Electronics Engineering	400	08033037622	hadizamuhammadabdul@gmail.com
17	Ramatu Yakubu Adamu	Mathematics	300	07032637036	ramatuyakubuadamu@gmail.com
18	Rebecca Samson	Agricultural Engineering	300	08169276257	samsonrebecca7@gmail.com
19	Silas Deborah	Civil and Water Resources Engineering	300	08087145292	deborahsilas2002@gmail.com
20	Ummi Kyari	Mathematics	300	09035363435	ummikyari16@gmail.com

Table 12: NDA Selected Students

8. Nigeria Defence Academy (NDA)					
School Contact Person: Lt Col Balogun					
School GBV Representative: Shekarau Victory - Jane					
S/N	Name of Students	Department	Level	P/No.	Email Address
1	Osadebe Chigozie Ruth	Computer Science	400	08028923126	ruthchi042@gmail.com
2	Olafuyi Oluwatobiloba Rukayat	Biotechnology	400	08108944400	olafuyioluwatobiloba@gmail.com
3	Orji Chukwunaza Maryjane	Civil Engineering	400	9014041080	maryjaneemjay121@gmail.com
4	Chukwunenye Winner	Biotechnology	400	8164357355	chinenyeworwinner@gmail.com
5	Awonusi Mary omolola	Computer science	300	8179380123	m8841582@gmail.com
6	Bello Catherine Zemaye	Electrical Electronics Engineering	300	09025045702	zemayebello@gmail.com
7	Abdulhameed faizah omobolade	Computer science	400	08086793457	faizahomobolade@gmail.com
8	Awa mullam	Mathematics	300	09061333049	awamullam@gmail.com
9	Gambo Irene Jonathan	Physics	300	08132096996	jonathanirene02@gmail.com
10	Francis Deborah Onyedikachi	Biotechnology	300	08052905539	deborahfrancisk39@gmail.com
11	Patrick Annastacia Aga	Mathematics	300	09077691329	annastaciapatrick973@gmail.com
12	Ige Oluwapelumi Olumayowa	Biotechnology	400	08029947824	igeoluwapelumi22@gmail.com
13	Kolapo Zainab	Biotechnology	400	08180726133	kolapofaridat@gmail.com

14	Rabe Amina Faith	Physics	300	08169995042	rabeamina849@gmail.com
15	Abiola Abolade Oluwatimilehin	Civil Engineering	400	09030281373	aboladeabiola17@gmail.com
16	Tim Chelsea Chisom	BIOTECHNOLOGY	400	`	timchelseachisom@gmail.com
17	OWOLABI PRECIOUS OLAITAN	BIOTECHNOLOGY	400	07041655234	owolabipreciousbgf@gmail.com
18	WILLIAMS PHILOMENA MONICA	COMPUTER SCIENCE	200	09120792519	hisgraceissufficient4@gmail.com
19	Stephen kunang Gwom	Mathematics	200	08068195307	stephenkunang@gmail.com
20	Mary D. Banky	Physics	300	7045332184	bankimary4@gmail.com

05
Training Delivery

5.1　Overview

The primary objectives for the training are that students should be able to;

- Foster a comprehensive understanding of technical and non-technical disciplines in renewable energy.
- Complete all topics in modules 1-12 on the Learning Management System (LMS).
- Successfully pass quizzes associated with each topic within modules 1-12.
- Develop skills and capacity for continued growth after the 6-week training program.

5.2　Approach
5.2.1　Mock Training Delivery – On LMS Platform

Drawing from one of the lessons during the student selection process, on the importance of having a mock process to prepare and perfect the system of delivery for each phase, the first step of our training delivery process was a mock training delivery. This phase aimed to ensure the learning management system is working optimally and forestall any possible challenges with the training delivery proper when it kicks off.

5.2.2　The Process

Just as was done during the student selection process phase, an in-house mock training delivery process was conducted. This involved a mock institution and some selected mock students. There was also an educator and a mock GBV representative assigned for the mock process. This was done to mirror what would be the ideal situation during the training delivery proper.

The first step was onboarding the students on the mock institution created on the learning management platform (LMS). This was done by creating student accounts for them. The login details for these accounts were shared with the students. Next, educator accounts were created for both the mock educator and the GBV representative. The goal of this was for them to properly monitor the students' training progress.

Next, a brief user guide tutorial on how to access the platform and take the course was then prepared and shared with the students. The same was done for the educator and GBV representative.

Thereafter, the students were invited to take the modules on the e-learning platform via email, with their login details. They were required to read through the text contents, watch the video presentations, and also take the quizzes. Afterwards, feedback was collected from the mock students on different areas such as content formats, possible errors, quiz formats, and other challenges.

This process, as was the initial objective, enabled the identification of possible challenges and issues with the training delivery, especially the use of the e-learning platform, picked the lessons, and drew recommendations toward the training delivery.

Figure 14: The Mock Training Delivery Process

5.2.3 Feedback & Recommendations

After the mock training delivery process, the necessary modifications were identified, feedback received, and hence recommendations for the needed adjustment, before the commencement of training. A few of the feedback received, and consequent adjustments were:

1. Some grammatical errors and errors in formatting were observed by some of the mock students and communicated across. Hence, the project team made the necessary adjustments to the content on the LMS.

2. Secondly, there was feedback on the length of the quizzes and the number of attempts. This was deemed challenging due to issues of network connectivity experienced by some mock students while taking them. Following this feedback, the project team adjusted the length of the quizzes, and also increased the number of attempts, to curtail this challenge.

5.2.4 Onboarding of Students, Educators, & GBV Representatives
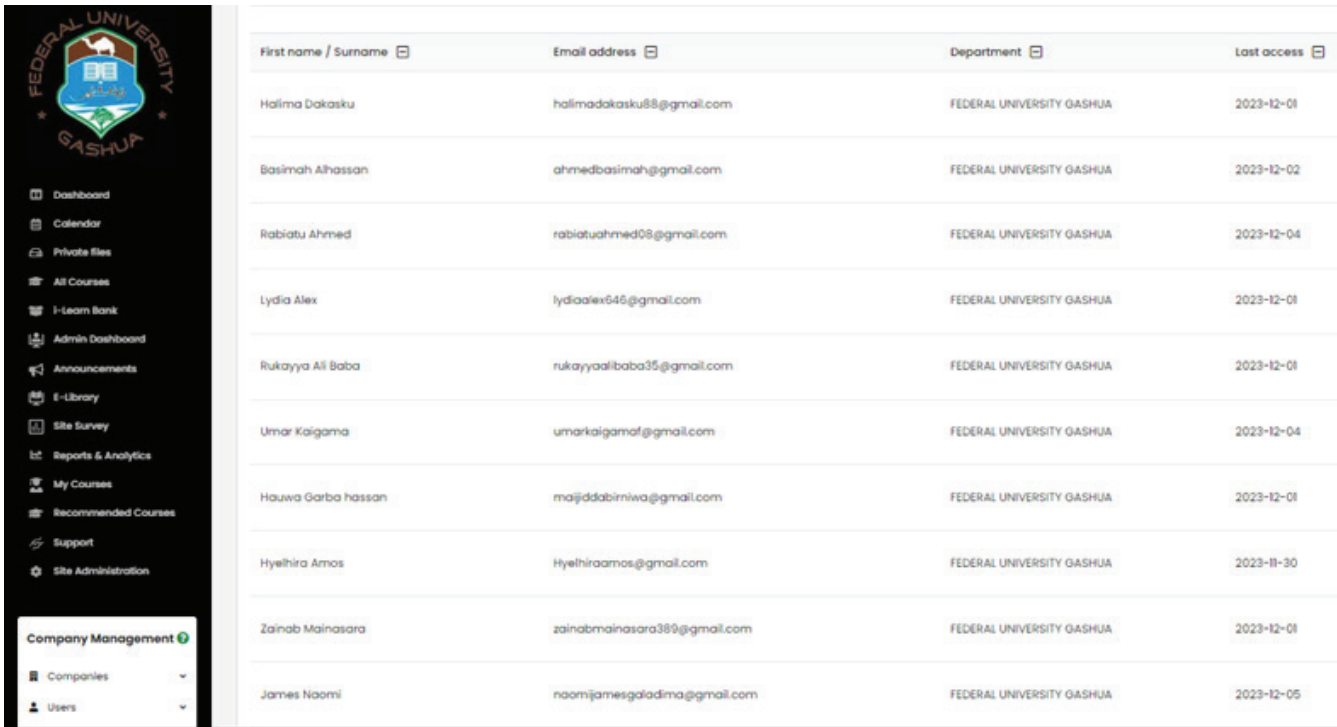
Upon completion of the mock training delivery, the next step was onboarding the students from all 7 beneficiary institutions, their educators, and the GBV representatives. This onboarding process involved; Account Creation, System for Ease of Communication, and User Guide Videos.

5.2.4.1 Account Creation
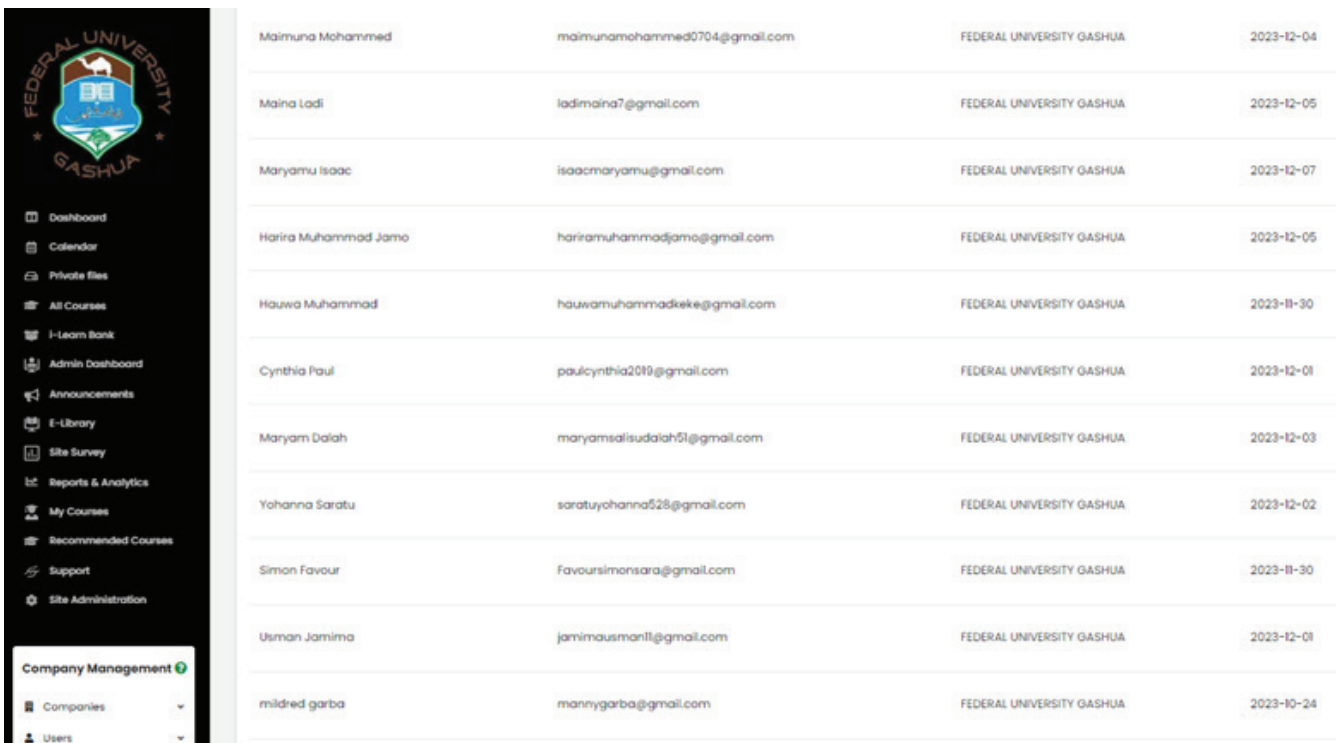
As the first step of onboarding, accounts were created for the 140 students across the 7 federal institutions. These accounts give the students access to the course: "Introduction to Fundamentals of Renewable Energy", of which the 12 modules had already been uploaded, in both text and video formats.

The username for sign-in was the email address of the students, and a generic password was provided for all students. However, upon login to the platform, students are mandated to change the generic password to a unique one of their choice.

Supervisor accounts were also created for the educators, and GBV representatives, which enables them to track students' attendance and participation.

First name / Surname	Email address	Department	Last access
Halima Dakasku	halimadakasku88@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
Basimah Alhassan	ahmedbasimah@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-02
Rabiatu Ahmed	rabiatuahmed08@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-04
Lydia Alex	lydiaalex646@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
Rukayya Ali Baba	rukayyaalibaba35@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
Umar Kaigama	umarkaigamaf@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-04
Hauwa Garba hassan	maijiddabirniwa@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
Hyelhira Amos	Hyelhiraamos@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-11-30
Zainab Mainasara	zainabmainasara389@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
James Naomi	naomijamesgaladima@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-05
Maimuna Mohammed	maimunamohammed0704@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-04
Maina Ladi	ladimaina7@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-05
Maryamu Isaac	isaacmaryamu@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-07
Harira Muhammad Jamo	hariramuhammadjamo@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-05
Hauwa Muhammad	hauwamuhammadkeke@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-11-30
Cynthia Paul	paulcynthia2019@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
Maryam Dalah	maryamsalisudalah51@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-03
Yohanna Saratu	saratuyohanna528@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-02
Simon Favour	Favoursimonsara@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-11-30
Usman Jamima	jamimausman11@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-12-01
mildred garba	mannygarba@gmail.com	FEDERAL UNIVERSITY GASHUA	2023-10-24

Figure 15: Students' Accounts for Federal University, Gashua (FUGA)

Figure 16: Students' Accounts for the Federal University of Agriculture, Abeokuta (FUNAAB)

Figure 17: Students' Accounts for Michael Okpara University of Agriculture, Umudike (MOUAU)

Figure 18: Students' Accounts for Nigerian Defence Academy (NDA)

	Dashboard			
	Folashade Abolarin	abolarinfolashade2021@gmail.com	UNIVERSITY OF ABUJA	2023-12-02
	Abubakar Sa'ad	jameelasaad001@gmail.com	UNIVERSITY OF ABUJA	2023-12-04
	Adebayo Tunmise	adebayoluwatunmishe@gmail.com	UNIVERSITY OF ABUJA	2023-12-01
	Ayomide Deborah	alabi.deborah2020@uniabuja.edu.ng	UNIVERSITY OF ABUJA	2023-12-11
	Jennifer Anjorin	anjorinjennifer16@gmail.com	UNIVERSITY OF ABUJA	2023-12-01
	Henrietta Uche	henriettaawah12@gmail.com	UNIVERSITY OF ABUJA	2023-12-04
	Paula Itamanwan	paulaedet65@gmail.com	UNIVERSITY OF ABUJA	2023-11-30
	Hikmatullah Abike	hakimahisal0@gmail.com	UNIVERSITY OF ABUJA	2023-11-30
	Phebe James	phoeebejames@gmail.com	UNIVERSITY OF ABUJA	2023-12-12
	Valentina Kizito	vadekivatoblack@gmail.com	UNIVERSITY OF ABUJA	2023-12-01
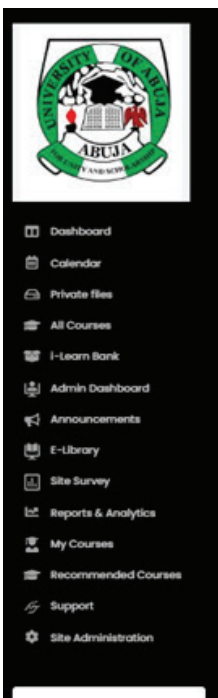
	Fatima Omoteniola	muhammedfatima1112@gmail.com	UNIVERSITY OF ABUJA	2023-12-04
	Hamidat Ismail	hamidatmuhammed03@gmail.com	UNIVERSITY OF ABUJA	2023-12-01
	Hauwau Aliyu	haliyum911@gmail.com	UNIVERSITY OF ABUJA	2023-12-01
	Folakemi Muse	favourchimzurum@gmail.com	UNIVERSITY OF ABUJA	2023-12-05
	Lauretta Sunday	laurettafumez@gmail.com	UNIVERSITY OF ABUJA	Never
	Deborah Olaniyan	olaniyan.deborah2020@uniabuja.edu.ng	UNIVERSITY OF ABUJA	2023-12-01
	Pam Chuwang	marypam122@gmail.com	UNIVERSITY OF ABUJA	2023-12-04
	Mohammed Munirat	sadiq.munirat2020@uniabuja.edu.ng	UNIVERSITY OF ABUJA	2023-11-30
	Peace Terna	ternapeace2004@gmail.com	UNIVERSITY OF ABUJA	2023-11-30
	Solimot Tiamiyu	tiamiyu.solimot2020@uniabuja.edu.ng	UNIVERSITY OF ABUJA	2023-12-01

Figure 19: Students' Accounts for the University of Abuja (UniAbuja)

Mary Kijie	maryakan4@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
Ayambim Joy	joyayambim33@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
BASSEY ANGELA	angelabassey1234@gmail.com	UNIVERSITY OF CALABAR	2023-12-01
Dakwan Favour	dakwanfavour@gmail.com	UNIVERSITY OF CALABAR	Never
Eboh Flourish	flourishoboh5454@gmail.com	UNIVERSITY OF CALABAR	2023-12-13
Ekong Christiana	ekongchristiana200@gmail.com	UNIVERSITY OF CALABAR	2023-12-13
Ekori Goodnews	ekori.ekori@yahoo.com	UNIVERSITY OF CALABAR	2023-12-12
Ekpon Abigail	ekponabigail@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
Ekponyong Comfort	commynino@gmail.com	UNIVERSITY OF CALABAR	2023-12-05
Eriworio Kogiesi	kogiesisam@gmail.com	UNIVERSITY OF CALABAR	2023-12-12

Etong Martina	etongmartina16@gmail.com	UNIVERSITY OF CALABAR	2023-12-13
Ikade Victoria	ikadevictoria@gmail.com	UNIVERSITY OF CALABAR	2023-12-14
Ogar Rose	ogarrosobanku68@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
Ogede Priscilla	priscillalutte375@gmail.com	UNIVERSITY OF CALABAR	2023-12-04
Okwo Stephanie	osastephanie0@gmail.com	UNIVERSITY OF CALABAR	2023-11-09
Osang Deborah	osangdeborah100@gmail.com	UNIVERSITY OF CALABAR	2023-12-14
Otu Loveth	love.dytiem@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
Blessing Chidinma	raphaelbc2000@gmail.com	UNIVERSITY OF CALABAR	2023-12-12
Gift Udida	giftudida8@gmail.com	UNIVERSITY OF CALABAR	2023-12-03
glory bassey	basseyglory193@gmail.com	UNIVERSITY OF CALABAR	2023-12-14

Figure 20: Students' Accounts for the University of Calabar (UniCal)
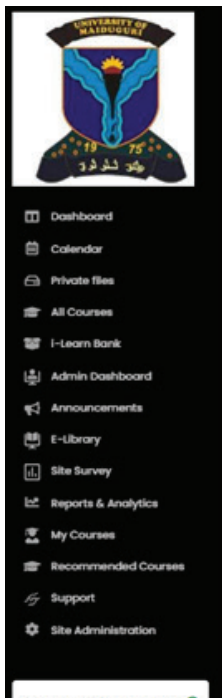
Olawumi Malikah	malikahabdulrasaqolawumi@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-01
Abubakar Hafsat	hafsatabubakarsuleiman@gmail.com	UNIVERSITY OF MAIDUGURI	2023-11-30
Adi Godiya	adigodiya9@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-01
Zara Ahmed	zaraahmed1226@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-06
Aisha Baba Muhammad	aishabmuhammad12122019@gail.com	UNIVERSITY OF MAIDUGURI	2023-12-09
Aisha Kabir Abbagana	ninakabir36@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-05
AISHATU Atom	aishatuatom66@gmail.com	UNIVERSITY OF MAIDUGURI	2023-11-30
Augustine Patience	ptncaugustine@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-14
Saliha Bawuro	salihabello2002@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-09
Dorcas Gideon	gideondorcas2018@yahoo.com	UNIVERSITY OF MAIDUGURI	2023-12-02
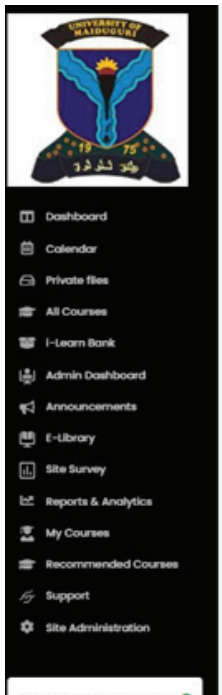
Hauwa Cletus	hauwacletus68@gmail.com	UNIVERSITY OF MAIDUGURI	2023-11-30
Hauwa Mohammed Rabiu	hauwarabiu5050@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-12
Ibrahim Zainab	xieumar@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-12
Jauro Aisha	aishajauro2021@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-12
Fatima Baba	fatimababamala007@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-11
Hadiza Abdullahi	hadizamuhammadabdul@gmail.com	UNIVERSITY OF MAIDUGURI	2023-11-30
Ramatu Yakubu	ramatuyakubuadamu@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-14
Rebecca Samson	samsonrebecca7@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-12
Deborah Silas	deborahsilas2002@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-01
Ummi Kyari	ummikyari16@gmail.com	UNIVERSITY OF MAIDUGURI	2023-12-06

Figure 21: Students' Accounts for the University of Maiduguri (UniMaid)

5.2.4.2 System for Ease of Communication

The next step of onboarding was creating a system for ease of communication during the training delivery. To achieve this, we opted for a WhatsApp group for each of the institutions. The invite link to the WhatsApp groups was sent to the students via email, and their educators and GBV representatives were also added to the group.

Throughout the training delivery, this platform (in addition to email correspondences and phone calls, when necessary) was used to communicate promptly with the students and get quick feedback and responses.
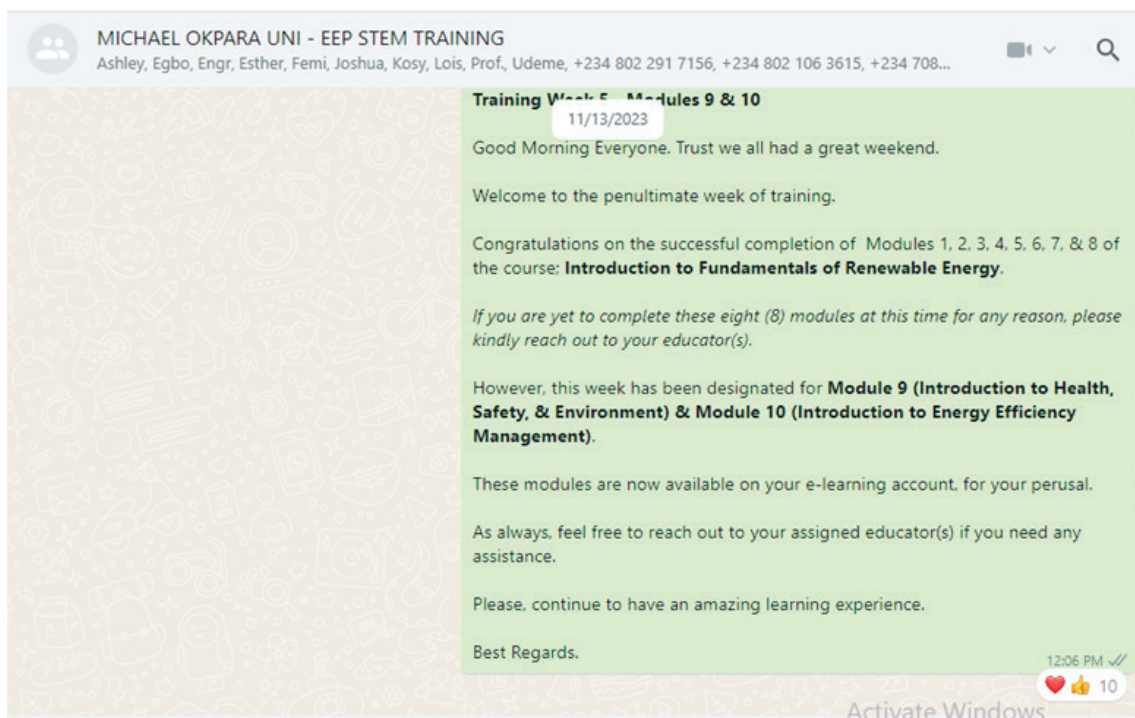
Figure 22: Screenshot of a Message Sent on The WhatsApp Group by The Project Team (MOUAU)

5.2.4.3 User Guide Videos

Another integral part of students' onboarding was the preparation of explanatory user guide videos that support them in accessing the platform and navigating it. Some of the videos prepared were:

- How to Log In and Change Password on the EEP SIPA Account
- How to Log Out from the Account
- How to Take a Course on the EEP SIPA Platform
- How to Take a Quiz on the EEP SIPA Platform

These videos were uploaded to a folder, and saved on Google Drive, and the link to access them was shared with the students on their WhatsApp groups.
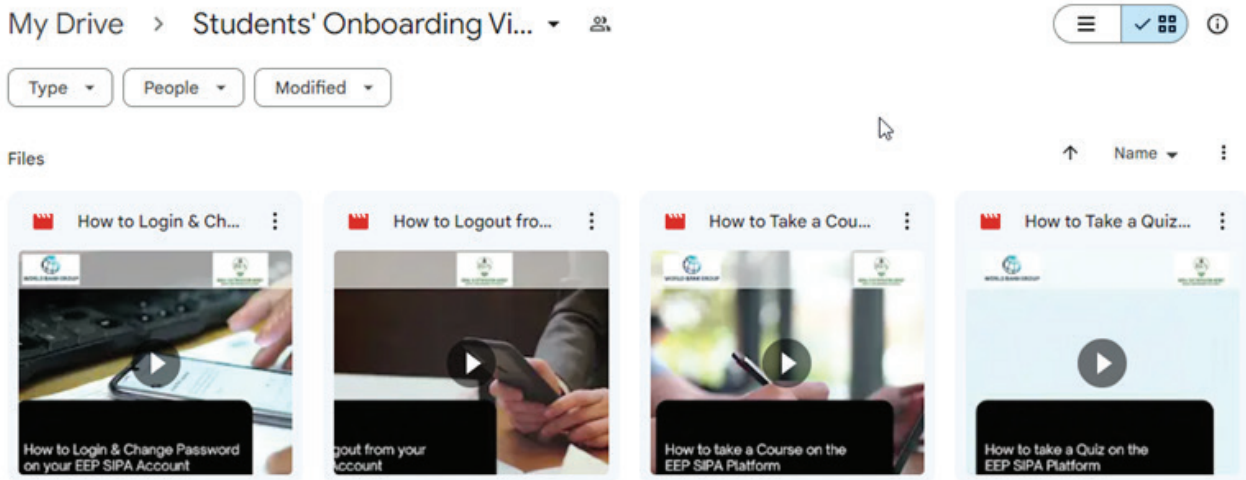
Figure 23: Thumbnails of the User Guide Videos Uploaded on the Drive for Students

5.2.5 Training Delivery Process
5.2.5.1 Mode of Training Delivery

The mode of training for the EEP Phase II STEM Internship program is hybrid, in the sense that it consists of virtual, online, and physical sessions. The courses are taken online through the Learning Management System (LMS), with videos and supervision by the instructors to guide them through the modules.

Additionally, support sessions and virtual calls by educators are also held to assist students every week during the training, and a physical visit is held a few times for classroom sessions, and basic practical sessions (where applicable).

Assessments in the form of quizzes after each topic were also provided, to ensure the students have a clear understanding of each module, as they progress.
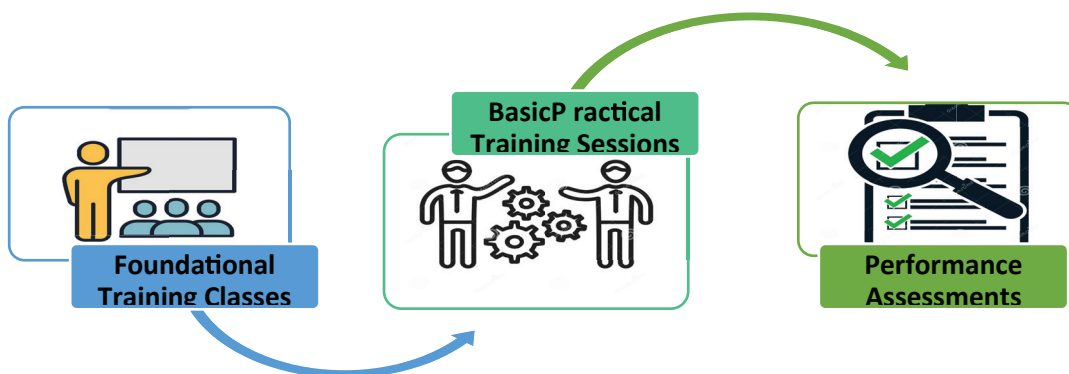
Figure 24: Training Delivery Structure

5.2.5.2 Training Participants

The training delivery was executed at the 7 federal universities spanning the six geo-political zones. The institutions are shown in the table below:

Table 13: Beneficiary Institutions

S/N	LOCATION	STATE	REGION
1	University of Abuja	FCT	North-Central
2	Michael Okpara University of Agriculture, Umudike	Abia	South-East
3	University of Calabar & Teaching Hospital	Cross River	South-South
4	University of Maiduguri & Teaching Hospital	Borno	North-East
5	Federal University of Agriculture, Abeokuta	Ogun	South-West
6	Federal University, Gashua	Yobe	North-East
7	Nigeria Defence Academy	Kaduna	North-West

5.2.6 Students

The primary participants and beneficiaries of the training were the 20 selected female STEM students from each institution (140 students in total). The list of selected students has been provided in the submitted student selection process report and approved.

Figure 25: Some of the Selected Students from FUNAAB, Abeokuta

5.2.7 Educators

As earlier stated in the project scope, each institution had at least 1 educator, skilled and experienced in not only the renewable energy sector but also in capacity building. These educators were responsible for guiding the students through their course and monitoring their performance and usage of the EEP SIPA platform.
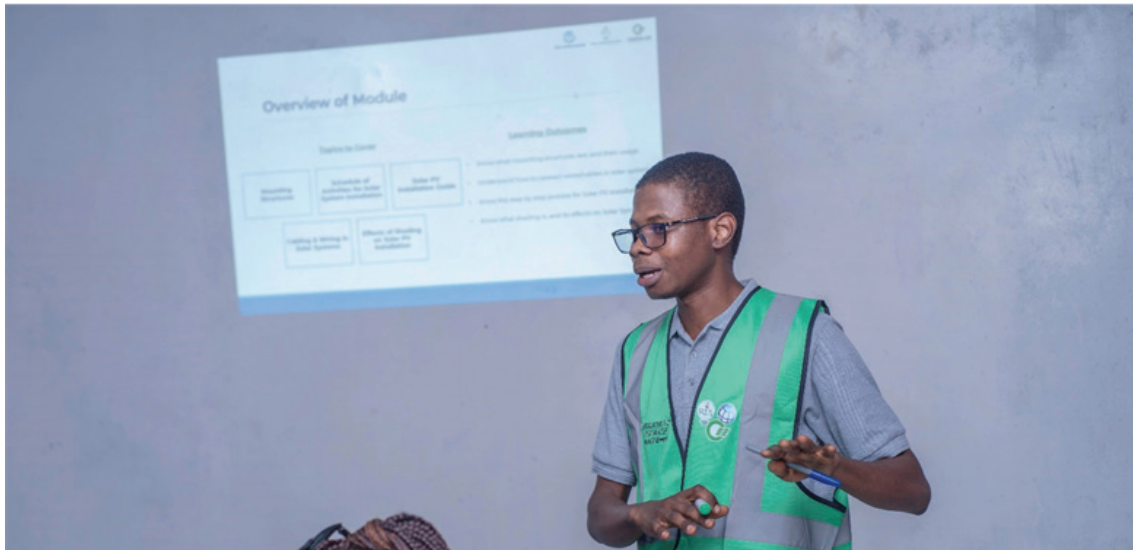
Figure 26: An Educator During a Classroom Session at the University of Maiduguri (UniMaid)

5.2.8 Gender-Based Violence (GBV) Representatives

During the training delivery, the Gender-Based Violence (GBV) representatives were equally another arm of supervision for the students. They had the same supervisory access as the educators and did their part in ensuring compliance from the students throughout the training. They also acted as the point of contact and link to the institutions in arranging visits, and other important training delivery concerns.

5.2.9 Situation Room Personnel

Throughout the training, a situation room was set up, domiciled in the office of the project manager, who was responsible for attending to issues from students. These issues range from difficulty logging in, recovery of account, change of login details, difficulties with taking the course, and issues with attempting the quizzes, amongst others. It was a daily 1-hour virtual session, and open to all the students with complaints and in need of support to join and get help.
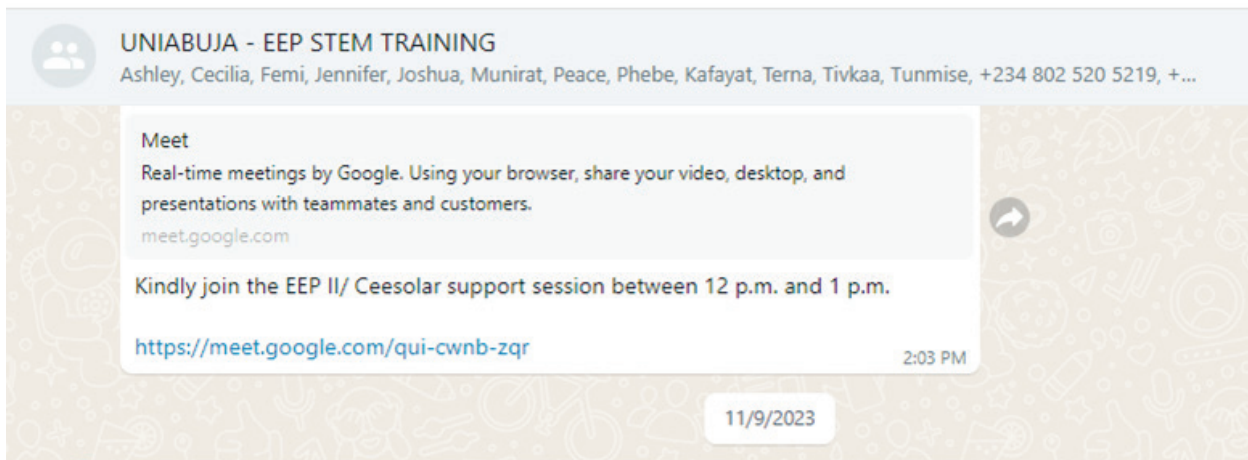
Figure 27: Screenshot of a Notification for Support Session on UniAbuja WhatsApp Group

5.2.10 Safeguard Specialist – HSE

During the basic practical sessions with the student, the safeguard specialist (HSE) was also present and pivotal in ensuring the safety of students on site, while handling electrical tools and equipment. This was to ensure low risks and hazards during the on-site training delivery.

5.3 The Training Delivery

As has been earlier stated, the training was carried out over 6 weeks with a focus on teaching the different topics on the Fundamentals of Renewable Energy.

A hybrid approach was used for the delivery, using the Learning Management System (LMS), virtual classroom sessions, and physical sessions as well. This ensures a well-rounded training experience.

During the training, students were also encouraged to take their quizzes and assessments by their educator, as a requirement that ensures they have a clear understanding of the lectures.

Additionally, in order to aid the students with learning, several training materials were provided.

Below is a summary of the training materials provided, and the weekly training delivery update.

5.3.1 Disbursement of Training Materials and Resources

In order to ensure proper implementation of this training, in addition to ease and convenience of training delivery for the students, some necessary training materials and resources were provided before the commencement of training. These are discussed below.

5.3.1.1 Learning Devices

First, learning devices in the form of tablets with accessories such as a keyboard, mouse, earphones, safety glasses, power bank, etc. were provided for each of the 140 selected students. These devices were given to aid the students in accessing the e-learning platform, and thus be able to take the course at their own time and convenience.

Figure 28: Some Students at FUNAAB, with Their Learning Devices

Figure 29: A Student at UniMaid Using Her Learning Device for Lectures

Figure 30: Some Students at UniAbuja Using Their Learning Devices for Lectures

5.3.1.2 Writing Materials & Tote Bags

In order to assist the students with taking notes either while covering their modules online or during in-person classroom sessions with their educators, writing materials were equally provided for the students. These writing materials were notepads and pens. They were placed inside a branded tote bag, for ease of moving them around.

Figure 31: The Tote Bag, Notepad, and Pen

5.3.1.3 Personal Protective Equipment (PPEs)

For the visits to the site, PPEs were also provided for the students. These items were; Safety Vests, Safety Helmets, Safety Gloves, and Safety Boots.

Figure 32: Students of Michael Okpara University, and their Educator, Kitted in their PPE

5.3.1.4 Data Subscription

To cushion the financial implications of the hybrid training, most especially the cost of taking the course online, and joining virtual classes, the students were provided with modest and sustainable data subscriptions throughout the training. These were done at different intervals during training delivery.
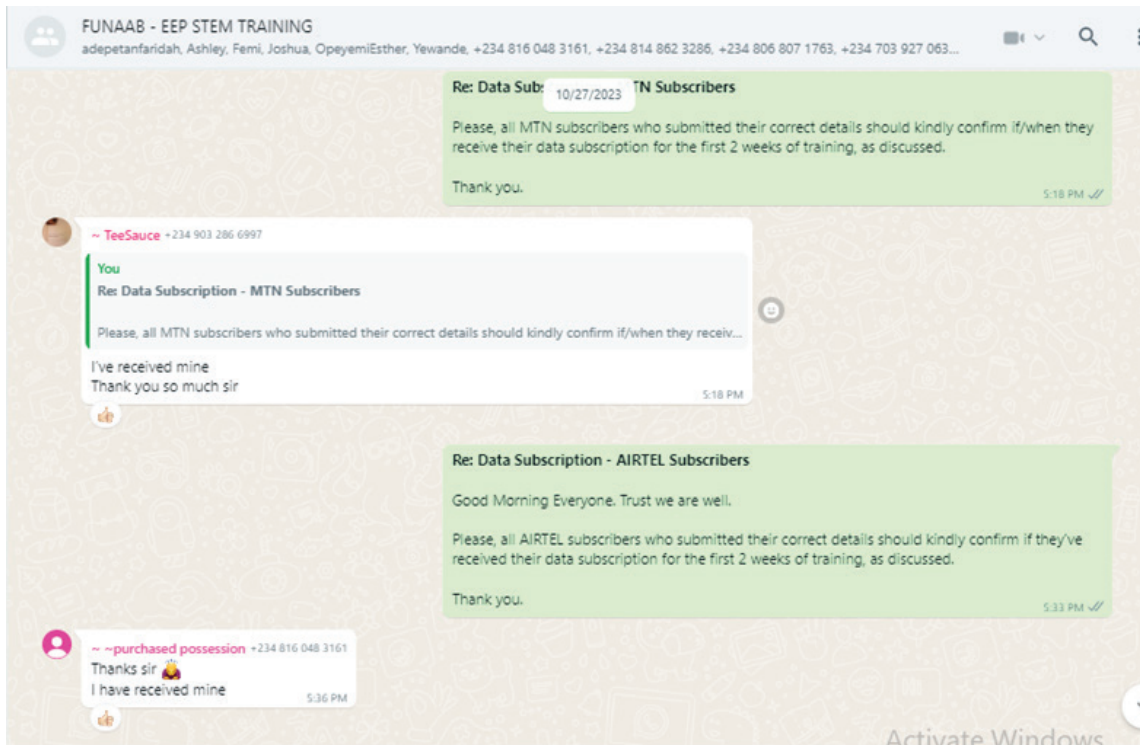
Figure 33: Evidence of Data Subscription – FUNAAB
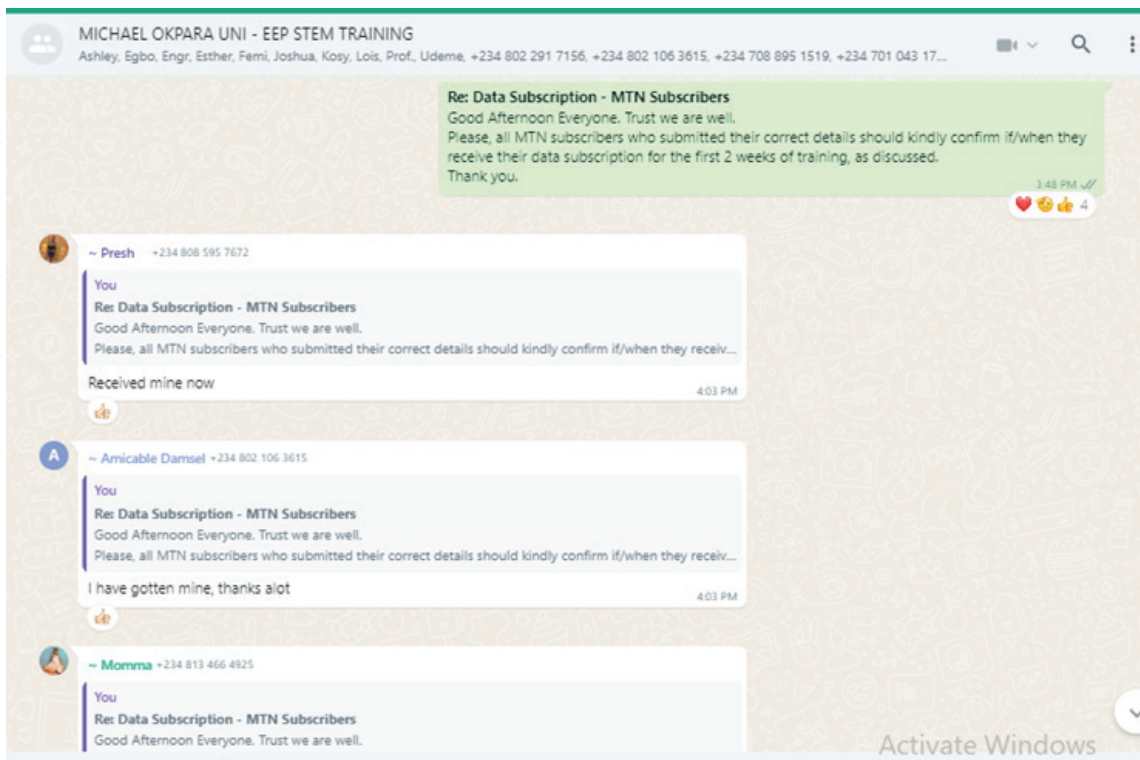
Figure 34: Evidence of Data Subscription – MOUAU

5.3.2 Weekly Reporting
5.3.3 Week 1
5.3.3.1 Training Objectives

The primary objectives during this week of training were as follows:
1. Ensure all students have a comprehensive understanding of energy fundamentals.
2. Guide students to know the different types and forms of energy, energy sources and energy conversion.
3. Introduce students to the basics of electricity, while also being able to identify electrical symbols.

Some key training activities included virtual meetings, physical meetings, support sessions, and continuous monitoring of students' progress.

5.3.3.2 Modules Covered

Two modules were covered during the first week of training, which were Module 1 - Introduction to Energy Fundamentals, and Module 2- Basics of Electricity. These modules were available on Learning Management System (LMS); EEP SIPA, and made accessible to all students, in all the institutions during the week. The students also took the quizzes available after each topic in the modules, as a part of the training.

Figure 35: Screenshots Showing Overviews of Modules 1 & 2 on EEP SIPA

5.3.3.3 Training Delivery Methodology

The methodology for the training delivery was a hybrid model, that involved online self-learning on the EEP SIPA, and a physical session.

1. **Online Self-Learning:** During the first week of training, students from all institutions took their modules online, using the EEP SIPA. Care was taken to provide access to just the required 2 modules for the week, in order to ensure organization and a steady pace of learning for the students.

   As the training progressed, the educators were on hand using their accounts to monitor each student in their institution, ensuring they were covering the required modules. There was also follow-up on students who were lagging for one reason or the other, to meet up the pace of others.

2. **Physical Sessions:** In addition to the online self-learning on the EEP SIPA by the students, the educators also had physical sessions with them. This visit was for proper introductions, whereby the educators get to know their students, and vice-versa. It was also an opportunity for the educators to provide hands-on support to the students with regard to challenges around log-in and LMS navigation.

Figure 36: First Visit to Federal University, Gashua (FUGA)

Figure 37: First Visit to the Federal University of Agriculture, Abeokuta (FUNAAB)

Figure 38: First Visit to the University of Maiduguri (UNIMAID)

Figure 39: First Visit to the University of Calabar (UniCal)

Figure 40: First Visit to the Nigerian Defence Academy (NDA)

Figure 41: First Visit to Michael Okpara University of Agriculture, Umudike (MOUAU)

Figure 42: First Visit to the University of Abuja (UNIABUJA)

5.3.4 Week 2
5.3.4.1 Training Objectives
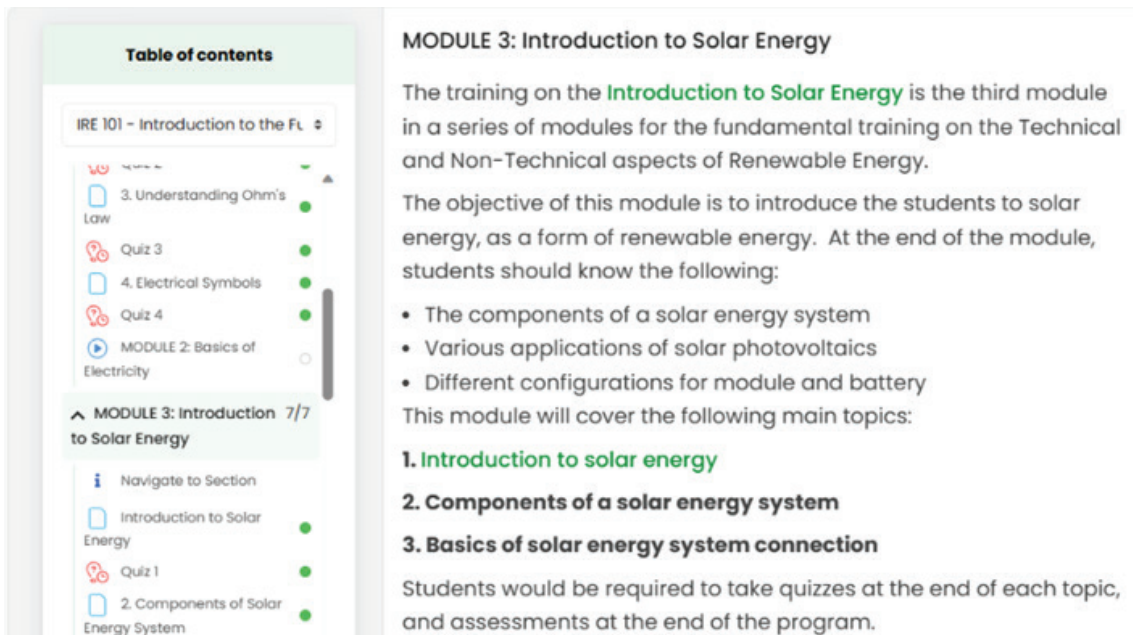
The primary objectives during this week of training were as follows:
1. Students should have a comprehensive understanding of solar energy.
2. They should know the components of a solar energy system
3. Understand the uses of each component of the solar energy system.
4. Know the different applications of solar energy systems in Nigeria and the available resources.

Key training activities included, virtual meetings, support sessions, and continuous monitoring of student progress on EEP SIPA.

5.3.4.2 Modules Covered

Two modules were covered this week, which were; Module 3 - Introduction to Solar Energy, and Module 4 - Solar Energy in Nigeria - Application and Resources. The modules were taken on EEP SIPA, coupled with the quizzes available at the end of each topic, under each of the modules. The educators also held a virtual class with the students at the end of the week, to summarize and review the modules.

Table of contents

IRE 101 – Introduction to the Fu

- 3. Understanding Ohm's Law
- Quiz 3
- 4. Electrical Symbols
- Quiz 4
- MODULE 2: Basics of Electricity

∧ MODULE 3: Introduction to Solar Energy   7/7

- i Navigate to Section
- Introduction to Solar Energy
- Quiz 1
- 2. Components of Solar Energy System

MODULE 3: Introduction to Solar Energy

The training on the **Introduction to Solar Energy** is the third module in a series of modules for the fundamental training on the Technical and Non-Technical aspects of Renewable Energy.

The objective of this module is to introduce the students to solar energy, as a form of renewable energy. At the end of the module, students should know the following:

- The components of a solar energy system
- Various applications of solar photovoltaics
- Different configurations for module and battery

This module will cover the following main topics:

1. Introduction to solar energy

2. Components of a solar energy system

3. Basics of solar energy system connection

Students would be required to take quizzes at the end of each topic, and assessments at the end of the program.

Figure 43: Screenshots Showing Overviews of Modules 3 and 4 on EEP SIPA

5.3.4.3 Training Delivery Methodology

Just as with the first week of training, there was equally a dual approach to delivery of the training during this week, with both online self-learning, and a virtual session.

1. Online Self-Learning: Access to modules 3 & 4 was given to the students on EEP SIPA, and they took their lessons both using the text contents and also the video presentation contents. While at it, they also were able to attempt the short quizzes that have been provided after each topic.

   The assigned educators for the schools also followed up on the progress the students were making, ensuring the lessons were completed, and the quizzes were taken as well.

2. Virtual Classroom Sessions: Additionally, the educators organized virtual classroom sessions for their students at the end of the week. These sessions aimed to follow up on the course completion rate for each student and support any that is lagging to be on par with the others. They also leveraged this opportunity to review the modules with their students, entertaining questions, inquiries, and the need for clarity.

5.3.5 Week 3
5.3.5.1 Training Objectives

The primary objectives during this week of training were as follows:
1. Students should have a comprehensive understanding of the process of energy audit.
2. Know how to size an off-grid energy system.
3. Know the key measurements in solar PV installation.
4. Identify the tools and equipment used in solar PV installation and their use case.

Key training activities included classroom sessions, online self-learning, support sessions, and continuous

monitoring of student progress.

5.3.5.2 Modules Covered

As it was in the previous weeks, two modules were also covered during the 3rd week of training. These were; Module 5 - Basics of Solar System Sizing, and Module 6 - Introduction to Tools & Equipment for Solar Installation. These modules were available on EEP SIPA, in both text format and video presentation format. Quizzes were also provided at the end of each topic, to assess the understanding on the part of the students.

Figure 44: Screenshots of Modules 5 & 6 Overviews on EEP SIPA

5.3.5.3 Training Delivery Methodology

The training delivery methodology employed during this week of training was both classroom sessions, and the online self-learning by the students.

1. **Online Self-Learning:** During this week, the students took their modules online using EEP SIPA, at their convenience, during the week. The platform was equally used to take the quizzes that were provided after each topic. Furthermore, the educators were always available to monitor from their account the progress of their students, as the week went by.

2. **Classroom Sessions:** For the classroom sessions, the educators visited the institutions, and gathered the students together, reviewing the modules covered, providing better explanations where necessary, and answering questions, amongst other things.

Figure 45: Classroom Session at MOUAU

Figure 46: Classroom Session at UniAbuja

Figure 47: Classroom Session at UniMaid

Figure 48: Classroom Session at FUNAAB

5.3.6   Week 4
5.3.6.1 Training Objectives

The primary objectives during this week of training were as follows:
1. Students should be able to identify the different types of solar PV mounting structures and their applications.
2. Know the schedule of activities and guide to solar PV installation.
3. Understand shading, and how it affects solar system installation and efficiency.
4. Know the different maintenance and troubleshooting measures for a solar system installation.

Key training activities included online self-learning, support sessions, basic hands-on practical sessions, and continuous monitoring of student progress.

5.3.6.2 Modules Covered

During week 4 of training, two modules were also covered. These were; Module 7 – Introduction to Solar PV System Installation, and Module 8 – Introduction to Maintenance and Troubleshooting of Solar PV Systems. These modules were available on EEP SIPA, in both text and video formats. Quizzes were also provided at the end of each topic, to assess the understanding on the part of the students.

Figure 49: Screenshots of Modules 7 & 8 on EEP SIPA Overviews

5.3.6.3 Training Delivery Methodology

The training delivery methodology employed during this week of training was both basic practical sessions, and the online self-learning by the students.

1. **Online Self-Learning:** During this week, the students took their modules online using EEP SIPA, at their convenience, during the week. The platform was equally used to take the quizzes that were provided after each topic. Furthermore, the educators were always available to monitor the progress of the students from their accounts, as the week went by.

2. **Basic Hands-on Practical Sessions:** As preparation for the start of the full on-site practical session with the contractors, the students were equally given an introductory practical session. This was basic and aimed at introducing them to some of the major equipment for solar PV system installation, and a guide to basic installation.

Figure 50: Students During Hands-on Practical Session at FUNAAB

Figure 51: Students During Hands-on Practical Session at UniAbuja

Figure 52: Students During Hands-on Practical Session at FUGA

Figure 53: Students During Hands-on Practical Session at UniMaid

5.3.7   Week 5
5.3.7.1 Training Objectives

The primary objectives during this week of training were as follows:
1. Students should be able to understand the concepts of health, safety, and environment.
2. They should be able to identify the safety symbols and what they all stand for.
3. Students should have an understanding of how fire extinguishers work and how to use them.
4. Know the different types of PPEs and where/how to use them.
5. Have an understanding of the key concept of energy efficiency management and its various applications.
6. Understand some of the energy conservation tips for homes and businesses.

Key training activities during the week included online self-learning, support sessions, virtual meetings, and continuous monitoring of student progress.

5.3.7.2 Modules Covered

During week 5 of training, two modules were also covered. These were; Module 9 – Introduction to Health, Safety, and Environment (HSE), and Module 10 – Introduction to Energy Efficiency Management. These modules were available on EEP SIPA, in both text format and video presentation format. Quizzes were also provided at the end of each topic, to assess the understanding on the part of the students.

MODULE 9: Introduction to Health, Safety, & Environment (HSE)

The training on Introduction to Health, Safety, and Environment is the ninth module under the course for the fundamental training on the Technical and Non-Technical aspects of Renewable Energy.

The objective of this module is to introduce the students to Health, Safety, and Environment (HSE) as an important area of installation and workplace organization. At the end of the module, students should know the following:

- The concept of health, safety, and environment
- The safety symbols and what they all stand for
- How fire extinguishers work and how to use them
- The different types of PPEs and where/how to use them

This module will cover the following main topics:

1. Introduction to health, safety, and environment

2. Electrical hazards Updated

3. Safety Symbols Updated

4. Understanding fire extinguishers

5. Personal protective equipment (PPE)

MODULE 10: Introduction to Energy Efficiency Management

The training on Introduction to Energy Efficiency Management is the tenth module under the module for the fundamental training on the Technical and Non-Technical aspects of Renewable Energy.

The objective of this module is to introduce the students to energy efficiency management as an important area of energy. At the end of the module, students should know the following:

- The key concept of energy efficiency management
- The various applications of energy management
- Some of the energy conservation tips for homes and businesses

This module will cover the following main topics:

1. Introduction to energy New **efficiency management**
2. Applications of energy management
3. Energy conservation tips Updated

Students would be required to take quizzes after each topic, and assessment at the end of the program.

1. Introduction to Energy Efficiency Management Updated

Figure 54: Screenshots of Modules 9 & 10 on EEP SIPA Overviews

5.3.7.3 Training Delivery Methodology

The training delivery methodology employed during this week of training was both virtual classroom sessions, and the online self-learning by the students.

1. Online Self-Learning: During this week, the students took their modules online using EEP SIPA, at their convenience, during the week. The platform was equally used to take the quizzes that were provided after each topic. Furthermore, the educators were always available to monitor the progress of the students from their accounts, as the week went by.

2. Virtual Class: Additionally, the educators scheduled and held virtual classes with the students at the end of the week. During these classes, there was a review of the modules covered, and the students had the opportunity to ask questions and get clarifications on areas that were not too clear.

5.3.8   Week 6

5.3.8.1 Training Objectives

The primary objectives during this week of training were as follows:
1. Understand the concept of supply chain management.
2. Know the elements of supply chain management.
3. Know why supply chain management is important, and the scope of supply chain management in Nigeria.
4. Students should also have a general overview of energy transition, and why energy management is key to transitioning.
5. They should see the processes and policies involved in energy transition.

Key training activities during the week included online self-learning, support sessions, continuous monitoring of student progress, and a physical visit for training close-out.

5.3.8.2 Modules Covered

During week 6 of training, the last two modules were covered. These were; Module 11 – Introduction to Supply Chain Management, and Module 12 – Roadmap to Energy Transition. These modules were available on EEP SIPA, in both text format and video presentation format. Quizzes were also provided at the end of each topic, to assess the understanding on the part of the students.
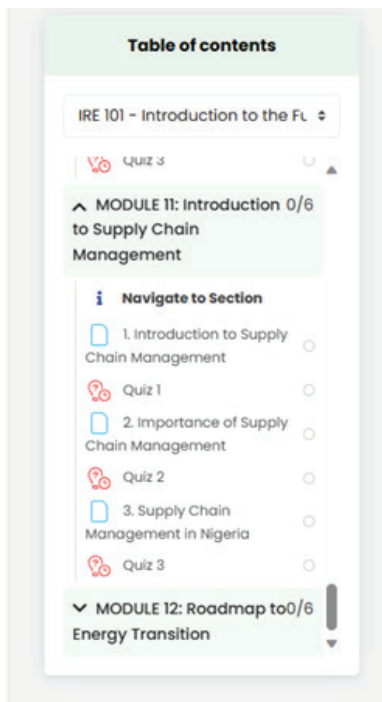
MODULE 11: Introduction to Supply Chain Management

The training on Introduction to Supply Chain Management is the eleventh course in a series of courses for the fundamental training on the Technical and Non-Technical aspects of Renewable Energy.

The objective of this course is to introduce the students to solar energy, as a form of renewable energy. At the end of the course, students should know the following:

- The concept of supply chain management
- The elements of supply chain management
- Why supply chain management is important
- The scope of supply chain management in Nigeria

This course will cover the following main topics:

1. Introduction to supply chain management

2. Importance of supply chain management

3. Supply chain management in Nigeria

Students would be required to take quizzes at the end of each topic, and assessments at the end of the program.
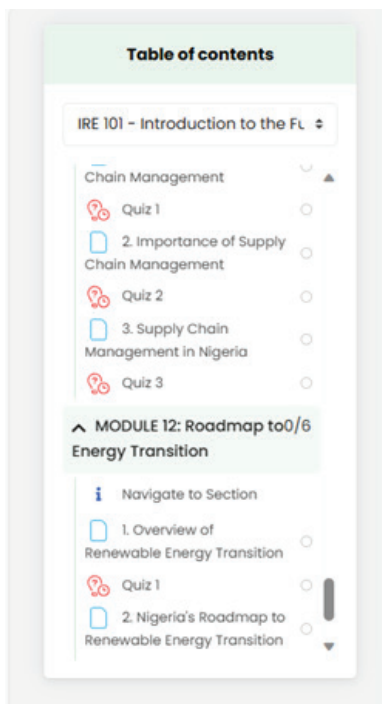
MODULE 12: Roadmap to Energy Transition

The training on the Roadmap to Energy Transition is the twelfth and final module in a series of modules for the course on the fundamental training on the Technical and Non-Technical aspects of Renewable Energy.

The objective of this module is to introduce the students to Nigeria's roadmap to energy transition. At the end of the module, students should know the following:

- A general overview of the renewable energy transition
- Understand why energy management is key to transitioning
- Know the process and policies involved in renewable energy transition

This module will cover the following main topics:

1. Overview of renewable energy transition

2. Nigeria's roadmap to renewable energy transition

3. Nigeria's roadmap to renewable energy transition

Students would be required to take quizzes at the end of each topic, and an assessment at the end of the program.

Figure 55: Screenshots of Modules 11 & 12 on EEP SIPA Overviews

5.3.8.3 Training Delivery Methodology

For the final week of training, the students took their modules online as usual, had a classroom revision session, and also a close-out of the training delivery at their institutions.

1. Online Self-Learning: As it has been from the first week of training, the students took their modules on EEP SIPA, and also took the quizzes that follow each topic under each module. The educators equally monitored the students' progress as the week lasted.

2. Classroom Revisions: Being the final week of training, the educators had a revision session with the students, to review all that has been taught in the course. It was also an opportunity to support the students who haven't finished their course as of this week to do so. Efforts were made to also attend to questions that the students might have from the course.

Figure 56: During a Classroom Revision Session at UniMaid

Figure 57: During a Classroom Revision Session at NDA

3. Close-Out of Training Delivery: Being the final week of training, there was a close-out of the training delivery across the institutions. Due to earlier delays from NDA, the close-out was conducted on a different date. The close-out events had the representatives of the school, the GBV representatives, REA resident engineers, educators, and the students in attendance.

During this event, pre-recorded messages from some industry professionals who are females were shared, coupled with goodwill messages from the school, REA, and Ceesolar. Some of the students also had an opportunity to give feedback and share their experiences.

Figure 58: Group Photograph During Training Delivery Close-Out Event at FUNAAB

Figure 59: Group Photograph During Training Delivery Close-Out at UniAbuja

5.4   Course Completion

The course had experienced remarkable course completion rates across all institutions, as shown in the table below:

Figure 60: Course Completion Rates

S/No.	Name of Institution	No. of Enrolled Students	No. of Students with Completed Course	Course Completion Rates (%)
1	Federal University, Gashua	20	20	100
2	Federal University of Agriculture, Abeokuta	20	20	100
3	Michael Okpara University of Agriculture, Umudike	20	20	100
4	Nigerian Defence Academy	20	20	100
5	University of Abuja	20	19	95
6	University of Calabar	20	18	90
7	University of Maiduguri	20	20	100

GBV representatives in the institutions where some students are yet to complete their course have been informed of this situation, and are following up to ensure this is done, even as construction kicks off on site. The assigned educators in those institutions are also in touch, to follow up on the progress.

5.4.1   Assessment and Evaluation
5.4.2   Assessment Methods & Criteria

Throughout the training, different methods were used to assess the students. These assessments aimed to ensure that the students do not just pass through the course, but the course also "passed through them". In other words, the assessments were used to test the students' levels of understanding and ensure that they fully grasped the knowledge that had been imparted, as was the goal.

The different assessment methods that were used are shown below:

Figure 61: Assessment Methods

5.4.2.1 Assessment Scoring Guide

The final score of each student was calculated at the completion of the training, based on a marking guide with an overall score of 100%. All assessment criteria, i.e. Quizzes, Attendance, Examination, and Presentation add up to the final score. The table below shows the marking guide for students' final assessment:

Figure 62: Students' Final Assessment Scores

S/No.	Assessment Criteria	Score (%)
1	Quizzes	30
2	Attendance	10
3	Presentation	20
4	Examination	40
Total		100

5.4.2.2 Summary of Student Assessments

Following the course completion, the educators for each institution compiled the students' assessments using the scoring guide provided in the table above. The summary of the student's assessments for each institution is shown below:

1. Federal University, Gashua (FUGA)

S/No.	First name	Surname	Email address	Quizzes (30)	Attendance (10)	Presentation (20)	Examination (40)	TOTAL (100)
1	Rabiatu	Ahmed	rabiatuahmed08@gmail.com	24.96	5	13.3	15	58.27
2	Lydia	Alex	lydiaalex646@gmail.com	26.81	10	18.9	26	81.75
3	Basimah	Alhassan	ahmedbasimah@gmail.com	29.73	9	18.9	27	84.65
4	Rukayya	Ali Baba	rukayyaalibaba35@gmail.com	18.33	5	11.1	13	47.44
5	Hyelhira	Amos	Hyelhiraamos@gmail.com	15.93	10	15.3	18	59.24
6	Halima	Dakasku	halimadakasku88@gmail.com	16.19	7.5	12.9	24	60.59
7	Maryam	Dalah	maryamsalisudalah51@gmail.com	27.08	9	18.0	37	91.11
8	Simon	Favour	Favoursimonsara@gmail.com	20.71	6.5	13.4	19	59.61
9	Hauwa	Garba hassan	maijiddabirniwa@gmail.com	6.11	2.5	4.5	11	24.14
10	Maryamu	Isaac	isaacmaryamu@gmail.com	12.74	6	10.2	15	43.99
11	Usman	Jamima	jamimausman11@gmail.com	28.94	5	14.6	24	72.58
12	Umar	Kaigama	umarkaigamaf@gmail.com	17.79	6	11.9	19	54.72
13	Maina	Ladi	ladimaina7@gmail.com	25.49	10	18.5	29	82.98
14	Zainab	Mainasara	zainabmainasara389@gmail.com	23.89	9	17.0	35	84.86
15	Maimuna	Mohammed	maimunamohammed0704@gmail.com	20.71	7	13.9	16	57.61
16	Hauwa	Muhammad	hauwamuhammadkeke@gmail.com	26.55	5	13.8	30	75.40
17	Harira	Muhammad Jamo	hariramuhammadjamo@gmail.com	28.14	8	17.4	18	71.52
18	James	Naomi	naomijamesgaladima@gmail.com	23.10	10	17.7	23	73.80
19	Cynthia	Paul	paulcynthia2019@gmail.com	25.75	5	13.6	33	77.34
20	Yohanna	Saratu	saratuyohanna528@gmail.com	22.83	8	15.6	15	61.44

Figure 63: Summary of Students' Assessments for Federal University, Gashua (FUGA)

2. Federal University of Agriculture, Abeokuta (FUNAAB)

S/No.	First name	Surname	Email address	Quizzes (30)	Attendance (10)	Presentation (20)	Examination (40)	TOTAL (100)
1	Adedoyin	Adegoke	adegoke.adedoyinanthonia@gmail.com	27.88	10.00	12.00	34.00	83.88
2	Rhoda	Adesanya	rhodaadesanya27@gmail.com	28.41	10.00	15.00	37.00	90.41
3	Gladness	Agboyinu	agboyinugladness@gmail.com	29.47	8.00	10.00	40.00	87.47
4	Temitope	Ajayi	joanajayi5@gmail.com	28.14	10.00	12.00	36.00	86.14
5	Matthew	Akachi	matthewvictoria99@gmail.com	28.94	10.00	10.00	36.00	84.94
6	Ola	Busola	olaelizabeth2018@gmail.com	25.49	7.00	10.00	36.50	78.99
7	Adebobuyi	Damilola	adebobuyidamilola01@gmail.com	29.73	10.00	15.00	39.00	93.73
8	Ayomide	Hamzat	hamzatayomide75@gmail.com	26.81	8.00	10.00	30.00	74.81
9	Uyiosenobua	Itua	uyiosenobua@gmail.com	29.58	10.00	5.00	38.00	82.58
10	Temitayo	Ojelade	temitayoojelade@gmail.com	27.88	10.00	15.00	34.00	86.88
11	Yetunde	Olamide	holuwanifemi720@gmail.com	29.20	10.00	15.00	36.00	90.20
12	Olaitan	Olatunde	olatundefo.19@student.funaab.edu.ng	26.28	7.00	15.00	28.00	76.28
13	Oluwadamilola	Olorunnishola	teedamilola71@gmail.com	27.35	6.00	12.00	37.00	82.35
14	Oluwaseun	Oloyede	oloyededamilola05@gmail.com	26.28	7.00	10.00	33.00	76.28
15	Adegbesan	Oluwatimileyin	adepejutimi10@gmail.com	29.73	10.00	15.00	39.00	93.73
16	Amarachi	Onwuzuruike	fdivine376@gmail.com	26.55	8.00	15.00	37.00	86.55
17	Motunrayo	Salami	salamielizabeth2019@gmail.com	29.47	10.00	17.00	39.00	95.47
18	Olamide	Sholanke	sholankeolamide2018@gmail.com	25.75	10.00	12.00	37.00	84.75
19	Oyelese	Simisolaoluwa	oyelesesimisola@gmail.com	29.73	10.00	17.00	38.00	94.73
20	Ukachi	Uloma	ulomapius@gmail.com	28.14	6.00	10.00	39.00	83.14

Figure 64: Summary of Students' Assessments for the Federal University of Agriculture, Abeokuta (FUNAAB)

3. Michael Okpara University of Agriculture, Umudike (MOUAU)

S/No.	First name	Surname	Email address	Quizzes (30)	Attendance (10)	Presentation (20)	Examination (40)	TOTAL (100)
1	Onyinyechi	Azih	azihonyinyechi@gmail.com	28.9	5.0	17	39	89.9
2	Obianuju	Blessing	aob.blessing@gmail.com	28.4	10.0	15	32	85.4
3	Blessing	Chisom	agbaegbuchisom@gmail.com	29.2	5.0	12	39	85.2
4	Ukamaka	Egbo	amakaegbo82@gmail.com	27.9	10.0	12	38	87.9
5	Chidinma	Enyiazu	miracleenyiazu@gmail.com	28.4	10.0	15	27	80.4
6	Onyinyechi	Godwin	merccy.godwin@gmail.com	28.7	10.0	17	40	95.7
7	Onwe	Ijeoma	prettynuella2000@gmail.com	26.3	10.0	16	40	92.3
8	Eberechi	Israel	veeafonne7@gmail.com	28.4	10.0	20	34	92.4
9	Sopuruchi	Israel	israelsopuruchi18@gmail.com	29.7	5.0	15	39	88.7
10	Precious	James	preciousjamesagbor@gmail.com	24.2	5.0	18	35	82.2
11	Nmesoma	Kelvin	kelgoodness2020@gmail.com	27.9	10.0	20	37	94.9
12	Lois	Nwamuo	humphreylois7@gmail.com	29.2	5.0	17	36	87.2
13	Mmesonmad	Nwaru	favournwaru@gmail.com	27.9	10.0	15	40	92.9
14	Oluomachi	Okafor	gloriaokafor78@gmail.com	28.1	10.0	12	32	82.1
15	Oluebube	Okorie	okorieoluebubemiracle@gmail.com	27.1	10.0	15	35	87.1
16	Nnenna	Okoroafor	okoropreshy15@gmail.com	29.2	10.0	10	40	89.2
17	Okoye	Onyinye	maryjaneokoye613@gmail.com	25.5	10.0	18	39	92.5
18	Chioma	Orisakwe	cikechukwu572@gmail.com	28.7	10.0	10	35	83.7
19	Stella	Ukachi	annastaciaukachi@gmail.com	27.6	10.0	20	37	94.6
20	Nancy	Uzochi	ernestnancy02@gmail.com	28.9	10.0	15	40	93.9

Figure 65: Summary of Students' Assessments for Michael Okpara University, Umudike (MOUAU)

2. Nigerian Defence Academy (NDA)

S/No.	First name	Surname	Email address	Quizzes (30)	Presentation (20)	Attendance (10)	Examination (40)	Total (100)
1	Faizah	Abdulhameed	faizahomobolade@gmail.com	26	14	10	21.5	72
2	Abolade	Abiola	aboladeabiola17@gmail.com	26	14	8	26.5	74
3	Mullam	Awa	awamullam@gmail.com	24	14	10	28	76
4	Mary	Awonusi	m8841582@gmail.com	19	13	10	8.5	50
5	Catherine	Bello	zemayebello@gmail.com	21	17	10	28.5	77
6	Tim	Chelsea	timchelseachisom@gmail.com	25	14	10	29.5	78
7	Winner	Chukwunenye	chinenyeworwinner@gmail.com	27	14	10	40	91
8	Deborah	Francis	deborahfrancisk39@gmail.com	24	14	10	30.5	79
9	Irene	Gambo	jonathanirene02@gmail.com	27	12	10	36	85
10	Oluwapelumi	Ige	igeoluwapelumi22@gmail.com	28	13	10	36	87
11	Zainab	Kolapo	kolapofaridat@gmail.com	18	12	10	17	40
12	Banky	Mary	bankimary4@gmail.com	23	16	10	27.5	77
13	Oluwatobiloba	Olafuyi	olafuyioluwatobiloba@gmail.com	24	18	6	28	76
14	Chukwunaza	Orji	maryjaneemjay121@gmail.com	22	14	10	25.6	71
15	Chigozie	Osadebe	ruthchi042@gmail.com	26	14	10	21.1	71
16	PRECIOUS	OWOLABI	owolabipreciousbgf@gmail.com	25	14	10	35.5	85
17	Annastacia	Patrick	annastaciapatrick973@gmail.com	23	13	10	27	73
18	Amina	Rabe	rabeamina849@gmail.com	28	12	10	36	86
19	Kunang	Stephen	stephenkunang@gmail.com	24	11	10	9	54
20	PHILOMENA	WILLIAMS	hisgraceissufficient4@gmail.com	23	12	10	2	47

Figure 66: Summary of Students' Assessments for Nigerian Defence Academy (NDA)

3. University of Abuja (UniAbuja)

S/No.	First name	Surname	Email address	Quizzes (30)	Presentation (20)	Attendance (10)	Examination (40)	Total (100)
1	Hikmatullah	Abike	hakimahisa10@gmail.com	28	0	8	34	70
2	Folachade	Abolarin	abolarinfolashade2021@gmail.com	23	3	10	16	52
3	Hauwau	Aliyu	haliyum911@gmail.com	27	12	4	32.8	76
4	Jennifer	Anjorin	anjorinjennifer16@gmail.com	29	16	10	39	94
5	Pam	Chuwang	marypam122@gmail.com	27	16	4	28.5	75
6	Ayomide	Deborah	alabi.deborah2020@uniabuja.edu.ng	29	12	10	26	77
7	Hamidat	Ismail	hamidatmuhammed03@gmail.com	29	16	8	33.5	86
8	Paula	Itamanwan	paulaedet65@gmail.com	25	0	4	26.5	56
9	Phebe	James	phoeebejames@gmail.com	30	19	8	40	97
10	Valentina	Kizito	vadekivatoblack@gmail.com	27	16	8	27	54
11	Mohammed	Munirat	sadiq.munirat2020@uniabuja.edu.ng	26	16	8	32.5	82
12	Folakemi	Muse	favourchimzurum@gmail.com	27	13	4	21	65
13	Deborah	Olaniyan	olaniyan.deborah2020@uniabuja.edu.ng	29	14	10	29	82
14	Fatima	Omoteniola	muhammedfatima1112@gmail.com	25	11	4	23.5	63
15	Abubakar	Sa'ad	jameelasaad001@gmail.com	28	16	8	31.5	83
16	Lauretta	Sunday	laurettafumez@gmail.com	0	0	0	0	0
17	Peace	Terna	ternapeace2004@gmail.com	29	16	10	39	94
18	Selimot	Tiamiyu	tiamiyu.selimot2020@uniabuja.edu.ng	27	16	10	27	80
19	Adebayo	Tunmise	adebayoluwatunmishe@gmail.com	27	9	10	35	81
20	Henrietta	Uche	henriettaawah12@gmail.com	27	11	10	30.5	79

Figure 67: Summary of Students' Assessments for University of Abuja (UniAbuja)

4. University of Calabar (UniCal)

S/No.	First name	Surname	Email address	Quizzes (30)	Attendance (10)	Presentation (20)	Examination (40)	TOTAL (100)
1	Ekpen	Abigail	ekpenabigail@gmail.com	20.17699	10	15	28	73.177
2	BASSEY	ANGELA	angelabassey1234@gmail.com	10.04867	10	0	21	41.0487
3	glory	bassey	basseyglory193@gmail.com	27.61062	8	20	40	95.6106
4	Blessing	Chidinma	raphaelbc2000@gmail.com	24.95575	8	0	37	69.9558
5	Ekong	Christiana	ekongchristiana200@gmail.com	23.09735	19	0	37	79.0973
6	Ekpenyong	Comfort	commynine@gmail.com	14.33628	10	0	5	29.3363
7	Osang	Deborah	osangdeborah100@gmail.com	27.45133	8	0	34	69.4513
8	Dakwan	Favour	dakwanfavour@gmail.com	0	0	0	0	0
9	Ebeh	Flourish	flourishebeh5454@gmail.com	29.20354	10	20	37	96.2035
10	Ekori	Goodnews	ekori.ekori@yahoo.com	20.17699	8	15	21	64.177
11	Ayambim	Joy	joyayambim33@gmail.com	25.75221	10	15	29	79.7522
12	Mary	Kijie	maryakan4@gmail.com	30.47788	8	20	40	98.4779
13	Eriworio	Kogiesi	kogiesisam@gmail.com	20.17699	10	0	21	51.177
14	Otu	Loveth	love.dytiem@gmail.com	24.69027	8	0	21	53.6903
15	Eteng	Martina	etengmartina16@gmail.com	27.87611	8	0	26	61.8761
16	Ogede	Priscilla	priscillalutte375@gmail.com	15.13274	10	0	15	40.1327
17	Ogar	Rose	ogarrosebanku68@gmail.com	23.62832	10	0	26	59.6283
18	Okwo	Stephanie	osastephanie0@gmail.com	1.59292	10	0	0	11.5929
19	Gift	Udida	giftudida8@gmail.com	26.81416	8	0	34	68.8142
20	Ikade	Victoria	ikadevictoria@gmail.com	29.46903	10	20	35	94.469

Figure 68: Summary of Students' Assessments for University of Calabar (UniCal)

5.   University of Maiduguri (UniMaid)

S/No.	First name	Surname	Email address	Quizzes (30)	Attendance (10)	Presentation (20)	Examination (40)	TOTAL (100)
1	Hadiza	Abdullahi	hadizamuhammadabdul@gmail.com	24.16	7.5	15	37	83.66
2	Zara	Ahmed	zaraahmed1226@gmail.com	15.40	5	10	24	54.40
3	Jauro	Aisha	aishajauro2021@gmail.com	19.65	2.5	5	20	47.15
4	AISHATU	Atom	aishatuatom66@gmail.com	17.79	10	20	28	75.79
5	Fatima	Baba	fatimababamala007@gmail.com	26.55	7.5	15	28.5	77.55
6	Aisha	Baba Muhammad	aishabmuhammad12122019@gail.com	26.55	7.5	15	38.5	87.55
7	Saliha	Bawuro	salihabello2002@gmail.com	25.75	5	10	36	76.75
8	Hauwa	Cletus	hauwacletus68@gmail.com	27.35	10	20	38	95.35
9	Dorcas	Gideon	gideondorcas2018@yahoo.com	27.88	2.5	5	28.5	63.88
10	Adi	Godiya	adigodiya9@gmail.com	16.46	7.5	15	13.5	52.46
11	Abubakar	Hafsat	hafsatabubakarsuleiman@gmail.com	22.57	7.5	15	30	75.07
12	Aisha	Kabir Abbagana	ninakabir36@gmail.com	25.75	10	20	33	88.75
13	Ummi	Kyari	ummikyari16@gmail.com	20.71	10	20	34.5	85.21
14	Olawumi	Malikah	malikahabdulrasaqolawumi@gmail.com	27.35	10	20	34.5	91.85
15	Hauwa	Mohammed Rabiu	hauwarabiu5050@gmail.com	25.22	7.5	15	26.5	74.22
16	Augustine	Patience	ptncaugustine@gmail.com	24.69	7.5	15	28.5	75.69
17	Rebecca	Samson	samsonrebecca7@gmail.com	23.10	7.5	15	28.5	74.10
18	Deborah	Silas	deborahsilas2002@gmail.com	26.55	7.5	15	33.5	82.55
19	Ramatu	Yakubu	ramatuyakubuadamu@gmail.com	20.99	7.5	15	26	69.49
20	Ibrahim	Zainab	xieumar@gmail.com	28.41	2.5	5	35.5	71.41

Figure 69: Summary of Students' Assessments for the University of Maiduguri (UniMaid)

5.4.3   Certifications

Certificates were awarded to all students who actively participated and successfully completed their modules in recognition of their participation and completion of the EEP Female STEM Internship training program.

(N.B: The original completion certificates had not been received from the REA as at the time of close-out, so students were awarded a temporary notification of course completion, pending when the certificates are ready).

Figure 70: Presentation of Notification of Course Completion to a Student at UniMaid

Figure 71: Presentation of Notification of Course Completion to a Student at FUGA

Figure 72: Presentation of Notification of Course Completion to a Student at FUNAAB

Figure 73: Presentation of Notification of Course Completion to a Student at UniAbuja

06
Post Internship Opportunities

Following the successful completion of the EEP Phase II STEM Internship training program, Ceesolar is thrilled by the exceptional talent and enthusiasm displayed by the participating students. In line with the project scope, and the need to further the value of the training, we developed a comprehensive post-internship training and mentorship program to nurture their skills further and guide them toward impactful careers in the renewable energy sector.

Our post internship plan consists of a well-rounded approach to build the capacity of the students well beyond the initial trainings or their internship with REA. The diagram below highlights the plan.
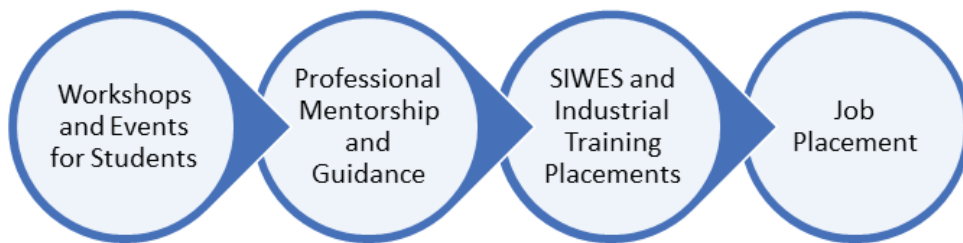

Figure 74: Process Flow for Post Internship Support

6.1 Renewable Energy Workshops and Events for Students

We would provide selected students with workshops and link them with events within the renewable energy sector. These events would build the individual capacity of the female students. This would also help them expand their network within industry, offering them more opportunities. Events we have planned to link the students to include REAN Conferences, Power Dialogue, etc.

6.2 Professional Mentorship and Guidance

A select group of outstanding and interested students from the internship program who demonstrated technical ability and a genuine passion for sustainable energy solutions were identified for Professional Mentorship and Guidance.

Mentorship would be provided by the Educators, and other selected professionals in the sector, especially females. These seasoned professionals would be best positioned to guide the selected students on their career path in the renewable energy industry.

6.3 Industrial Training (IT) Placements

As a part of the plan, selected beneficiary students who are currently in the student levels for IT Placements, that is usually 300Level or 400Level depending on the department, will be introduced to renowned renewable energy firms, in addition to Ceesolar. Some of these companies that have been identified are: Ashdam Solar, Solar Sister, Sosai Renewable Energies Company, etc. These companies will

screen the nominated students, and choose them for this opportunity. This phase of the program is tailored to deepen their understanding of renewable energy technologies, project management, and industry best practices.

6.4 Job Placements

Outstanding students who are currently in their final year at school will also be introduced to selected renewable energy companies for employment. Additionally, students that excelled in the SIWES/IT placement will also have the opportunity to be retained by the organizations on a full-time basis. This helps them begin their career in the renewable energy sector.

07
Challenges and Mitigations

7.1   Student Selection Process

A few challenges were encountered during the student selection process. These challenges and the mitigation measures are outlined below:

S/No.	Challenges	Mitigations
1	Students' level of participation in the registration phase: Some schools had slow responses at the beginning, such as; FUGA, and the University of Calabar.	1. Conducted a mock exercise of the student selection process in-house, before the commencement of the process itself. 2. The support of the GBV representatives in these schools was sought, and also the key representatives or contacts in the schools, which greatly improved responses. 3. The follow-up reminder email and text messages, coupled with the phone call follow-up also contributed to improved responses.
2	Internet Connectivity/Network Issues: There were certain instances where internet connectivity/ network issues challenged the smooth communication with students.	1. Leveraged the use of different internet service provider options, to mitigate this challenge. 2. Opted for a phone call interview as against an online meeting for the interviews to forestall this challenge.
3	Incorrect Email Address or Phone Number: There was a challenge communicating with some students due to incorrect email addresses or phone numbers.	The schools' GBV representatives were notified of the students who had difficulties reaching out, and they assisted in getting alternative phone numbers or email addresses, as the case may be.

7.2   Training Delivery

A couple of challenges were experienced during the implementation of this training program, and some measures of mitigations were taken to address them. These are shown in the table below:

S/No.	Challenges	Mitigations
1	Diverse academy schedules for different institutions and also for the different students belonging to separate departments in each institution.	First, the academic calendar of each institution was requested and studied before commencement of training, to aid in proper planning. The use of the online training platform; EEP SIPA, helped ensure students don't necessarily have to gather together at all times before taking their lectures.
2	The tight schedule of activities at the Nigerian Defence Academy, slowed down the pace of training delivery at the institution.	The project team requested for the periods when the cadets in the academy have access to their devices and also give time for lectures. This was discovered to be during the prep period between 20:00 and 22:00, during weekdays, and afternoons on weekends. Hence, the educator arranged for physical and virtual classes for these periods.
3	The delay in the kick-off of construction of the power plant in most institutions, as at the time of training delivery, this affects the on-field experience alongside classroom lectures.	Arrangements were made to have basic hands-on practical sessions with the students, before they go to the site, in order to add to their foundational knowledge from the classroom and online platform.

08
Students Feedback

After the final assessment was completed, a feedback exercise was conducted. A total of 123 students participated in the feedback exercise and their responses were recorded. The shortfall in the number of responses gotten from the 140 students' participants were due to various factors, such as; some students who had finished their program and graduated as at the time of feedback collection, and some who couldn't participate due to their tight academic schedule.

The percentage distribution of students' responses across the institutions out of the total of 123 responses gotten is shown below:
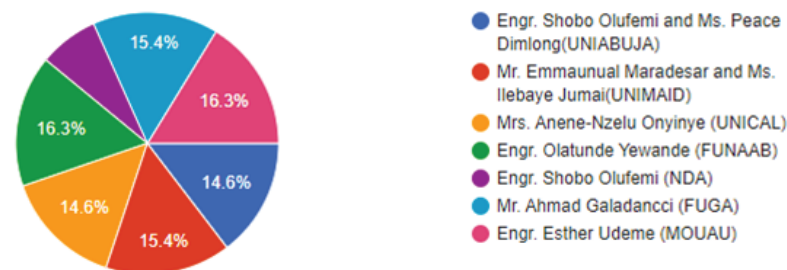

Figure 75: Students' Feedback Response Rate by Institution

8.1.1 Feedback on Course Content

Course Organization: Based on the survey results, the course organization was rated on a scale of 1 to 5, where 1 is Very Poor, 2 is Poor, 3 is Good, 4 is Very Good and 5 is Excellent.
0.8% of students rated the course as Very Poor, 0% of the students rated as Poor, while 2.4% of students rated the course as Good. On the other hand, 17.1% of students rated the course as Very Good, and an overwhelming majority of 79.7% of students rated the course as Excellent. This is shown in the chart below.
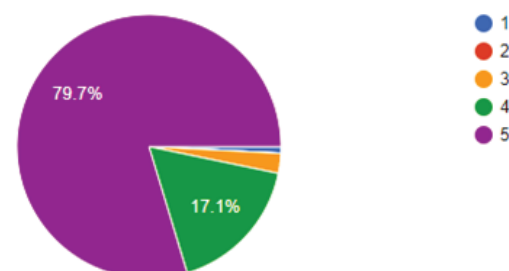

Figure 76: Students' Feedback on Course Organization

Relevance of Course Content: The students were further requested to rate the course content with regards to relevance to the course title. The rating scale used was from 1 to 5, where 1 is Very Poor, 2 is Poor, 3 is Good, 4 is Very Good, and 5 is Excellent.

From the feedback received, 0.8% rated the relevance of the content as Very Poor, 0% rated as Poor, 0.8% rated as Good, 18.7% felt it was Very Good, and a higher percentage of the students; 79.7% rated the relevance of the course content as Excellent. This is shown in the chart below.

Relevance of Content

123 responses
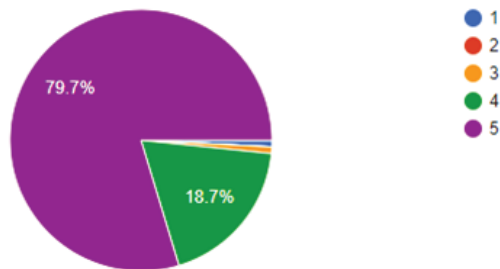
Figure 77: Students' Feedback on Course Content Relevance

Clarity of Instructions: The students were equally asked to rate the clarity of the course instructions. The same scale was used; 1 to 5, where 1 is Very Poor, 2 is Poor, 3 is Good, 4 is Very Good, and 5 is Excellent.

0.8% rated this as Very Poor, 0% rated it as Poor, 5.7% rated as Good, 22.8% recorded Very Good, and 70.7% found the clarity of instructions Excellent. This is shown in the chart below.

Clarity of Instruction

123 responses

Figure 78: Students' Feedback on Clarity of Instructions

8.1.2 Feedback on Resources and Materials
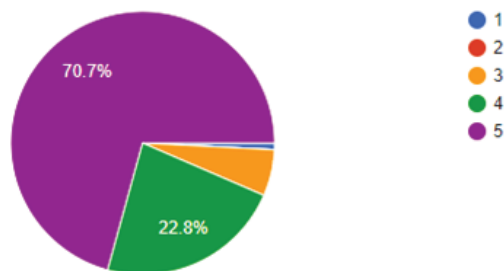
Training Materials: The feedback received for the training materials were positive and indicated its effectiveness. Participants found the material to be comprehensive, which helped them gain a deeper understanding of the fundamentals of renewable energy.

This rating was done on a scale of 1 to 5, with 1 representing Very Poor, 2 standing for Poor, 3 for Good, 4 for Very Good, and 5 for Excellent.

0% of participants rated the training materials as Very Poor, 0% also rated them as Poor, whereas 0.8% of participants rated them as Good, 22% did Very Good, and the largest audience of 77.2% concluded that they were excellent. This is shown in the chart below.
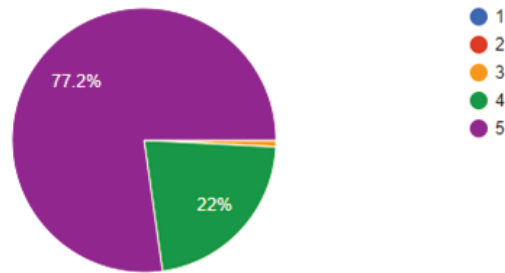
Figure 79: Students' Feedback on Training Material

Assignments and Projects: The feedback received on assignments and projects provided in the course showed they were highly appreciated by the participants, and considered well-designed, offering practical application of the course content.

A scale of 1-5 was used, where 1 stands for Very Poor, 2 represents Poor, 3 stands for Good, 4 is Very Good, and 5 is Excellent.

After the survey, 0% of participants felt the assignments and projects were Very Poor. 0% equally rated them as Poor. 2.4% of the students felt they were Good, while 35% rated them as Very Good, and the higher percentage of 62.6% deemed them Excellent. This is shown in the chart below.

Figure 80: Students' Feedback on Assignments and Projects

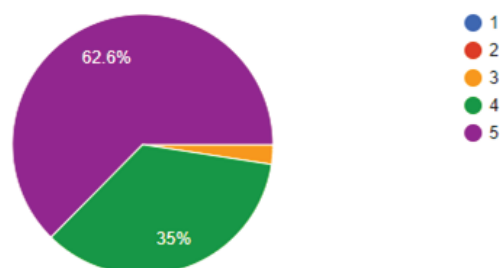**Course Materials and Resources:** The course materials provided for the fundamentals of renewable energy were very helpful and informative, as reported by the participants.

This was assessed on a scale of 1 to 5, where 1 represents Very Poor, 2 stands for Poor, 3 is Good, 4 stands for Very Good, and 5 represents Excellent.

At the end of the survey, 0% of the students felt the course materials and resources were Very Poor. Also, 0% felt they were Poor. 3.3% of the participants reported them as Good, 17.1% considered them Very Good, and 79.7% found them to be Excellent. This is shown in the chart below.
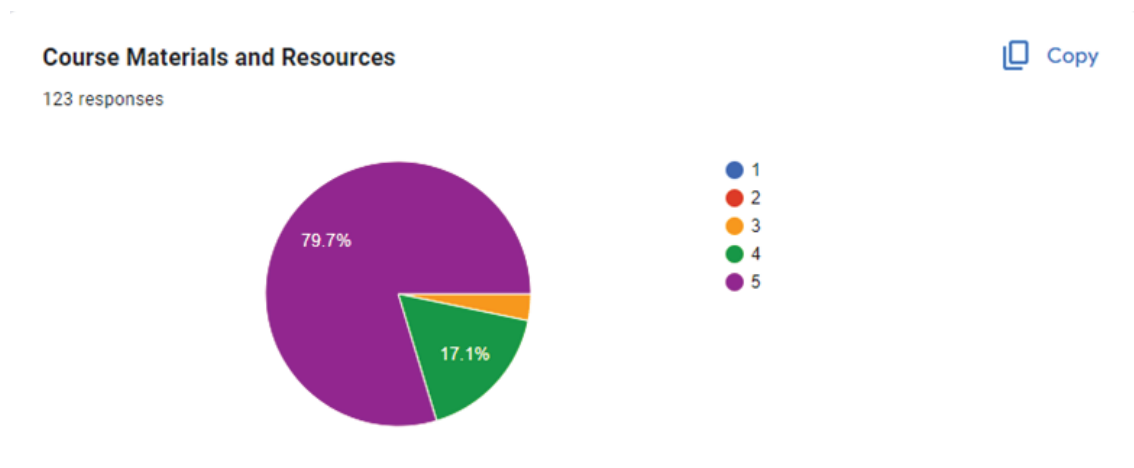

Course Materials and Resources

123 responses

- 1
- 2
- 3
- 4
- 5

79.7%

17.1%

Figure 81: Students' Feedback on Course Materials and Resources

8.1.3   Feedback on Instructors

Availability of Instructor: It was essential for the instructor to be available to respond to the participants' needs. The feedback received from the participants showed that the instructor's consistent availability ensured timely support, leading to a supportive learning environment.

The students were required to rate the availability of their instructors based on the following keys: Consistently Available, Mostly Available, Occasionally Available, Infrequently Available, and Never Available.

0% of the respondents reported the instructor's availability as Never Available. Also, 0% felt the instructors were Infrequently Available. 8.1% reported it as Occasionally Available, and 78% felt their instructor was Consistently Available. This is shown in the chart below.

Availability of Instructor

123 responses   📋 Copy

- Consistently Available
- Mostly Available
- Occasionally Available
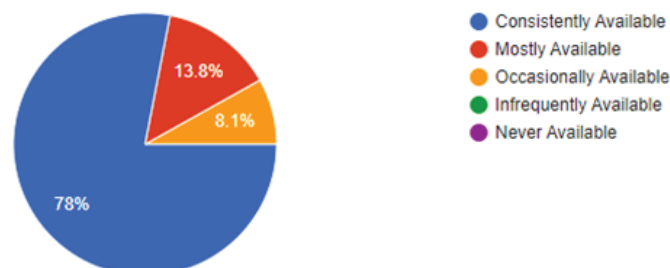- Infrequently Available
- Never Available

13.8%
8.1%
78%

Figure 82: Students' Feedback on Availability of Instructor

Effectiveness of Instructors Feedback: The instructors were largely found to be effective by the participants, from the feedback collected.

The feedback on this was collected using the following keys: Highly Effective, Effective, Moderately Effective, Ineffective, and Highly Ineffective.

1.6% of the participants found their instructors to be Highly Ineffective, while 0.8% rated their instructors as Ineffective. 4.1% responded as Moderately Effective, 14.6% felt they were Effective and the majority 78.9% rated their instructors as Highly Effective.

Instructor's Effectiveness of Feedback

123 responses   📋 Copy

- Highly Effective
- Effective
- Moderately Effective
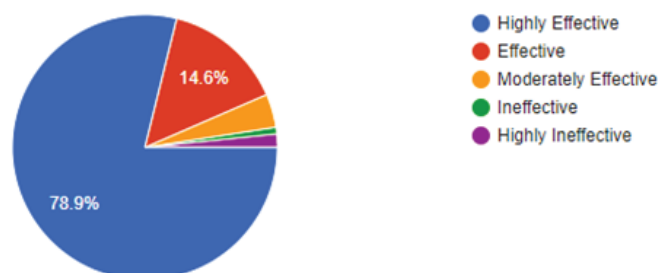- Ineffective
- Highly Ineffective

14.6%
78.9%

Figure 83: Students' Feedback on Effectiveness of Instructors Feedback

8.1.4   Personal Growth and Future Steps

Personal Learning: During the course, participants felt they experienced significant growth in their personal learning and development in their understanding of renewable energy fundamentals.

The keys used to rate this were: Substantial Growth, Significant Growth, Moderate Growth, Limited Growth, and No Discernible Growth.

From the feedback, 0% reported No Discernible Growth, and 0% also felt they had Limited Growth. However, 4.1% said they had Moderate Growth. 79.7% reported they had Significant Growth, and 16.3% for Substantial Growth.

Personal Learning and Growth

123 responses
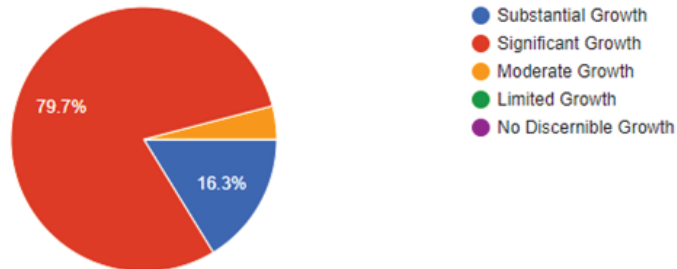
Figure 82: Students' Feedback on Personal Learning and Growth

Future Improvement Steps: Constructive suggestions have been offered to fine-tune specific aspects of the course, aiming for an elevated learning experience in upcoming sessions.

From the feedback, 13% were interested in joining renewable energy organizations/clubs, 22% suggested engaging in internship/research opportunities, 15.4% felt pursuing advanced renewable energy courses is their choice future improvement step, and 69.9% voted for all of the three.

Future Steps for Improvement

123 responses

Figure 83: Students' Suggestions for Future Improvement

8.1.5 Additional Comments on the Training

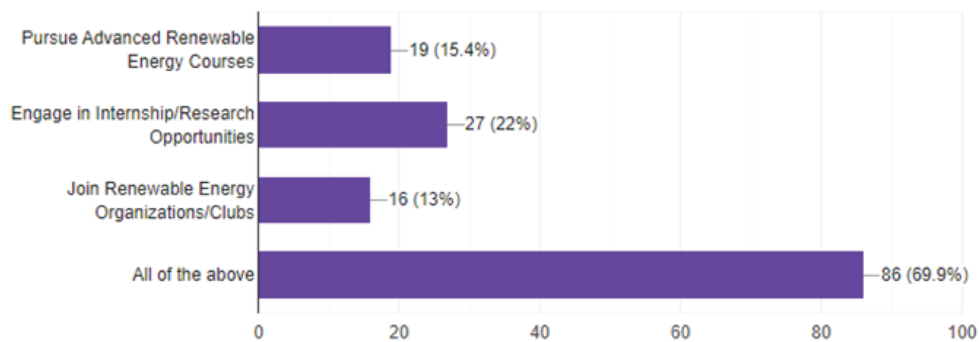Participants provided constructive feedback, offering valuable suggestions for enhancing specific aspects of the training. These insights aim to contribute to the continuous improvement of the training program. Some of the suggestions made by the students are:

- "I suggest that there should be the availability of more training tools and equipment for practical applications."
- "Increasing the number of quiz questions and making it a little more challenging."
- "There is no improvement because all the online courses and the ones we did practically are perfect."
- "I suggest that there should be availability of more training tools and equipment for practical applications."
- "The class was insightful and I'd suggest you give recommendations of where and how we can explore more and better in this field either by going for advanced classes on renewable energy or opting for internship programs for us to make the best use of this opportunity and make the organization proud at large."
- "My suggestion for improvement is that, if possible, more physical classes should be embraced."
- "I improved with many things like renewable energy and connecting solar and panel to bring electricity and with batteries I wish this program would lead us to permanent work so that we would achieve more and have more experience on solar energy thank you."
- "Instructors should be closer to students to get feedback about the training like mentoring."

8.1.6 Overall Rating

Overall Satisfaction: Majority of the participants said they were highly satisfied with the renewable energy fundamentals course, citing its effectiveness and overall positive learning experience.
The keys used were: Highly Satisfied, Satisfied, Neutral, Dissatisfied, and Highly Dissatisfied.
0% rated their satisfaction with the course as Highly Dissatisfied, 0.8% opted for Dissatisfied, 2.4% for Neutral, 24.4% for Satisfied, and 72.4% rated their satisfaction with the course as Highly Satisfied. This is shown in the chart below:
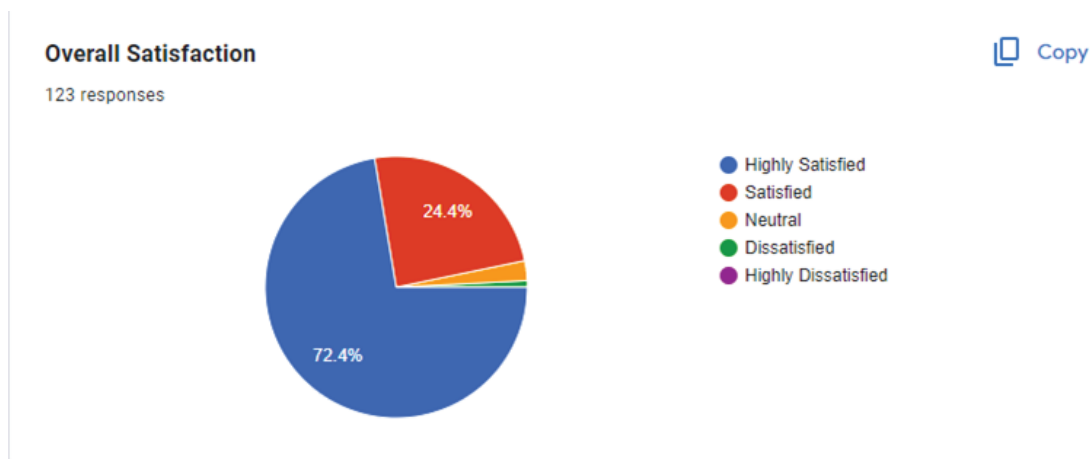

Figure 84: Students' Feedback on Overall Satisfaction

Most Liked Aspects of the Course: Participants were asked to choose from some of the aspects of the course on which ones they liked the most, in terms of the contribution to a positive learning experience.

From the feedback, 48% of the participants opted for Engaging Class Discussions, 69.1% chose Practical Applications, and 30.9% selected Supportive Class Environment. This is shown in the chart below.
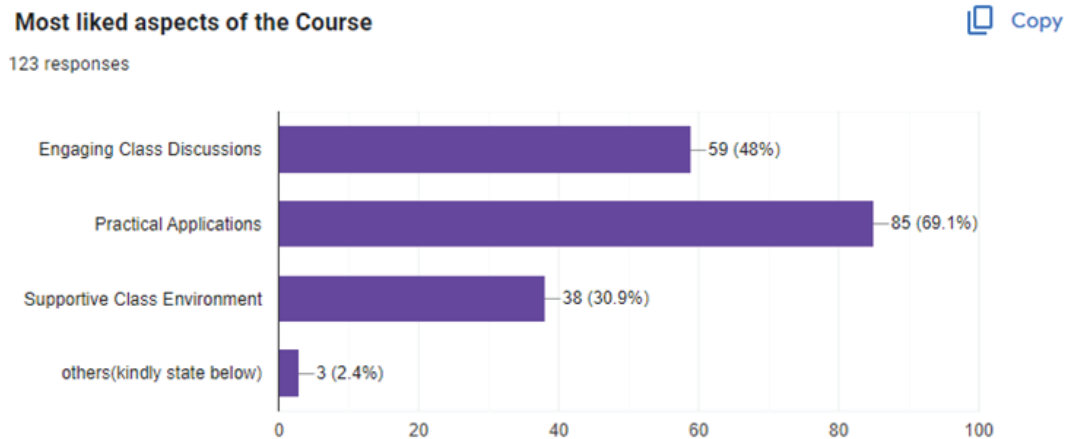

Most liked aspects of the Course

123 responses

Engaging Class Discussions		59 (48%)
Practical Applications		85 (69.1%)
Supportive Class Environment		38 (30.9%)
others(kindly state below)		3 (2.4%)

Figure 85: Student Feedback on Most Liked Aspect of the Course

General Comments: These general comments provide participants with a valuable opportunity to share broader insights, perspectives, and suggestions that may not be specific to individual course components. These comments offer a holistic view of the overall learning experience and serve as a platform for participants to contribute to the continuous improvement of the program. some of the major comments from the students are:

• 'I want to especially thank all the organizers of this program, for exposing me to this knowledge, from a novice young lady to an average knowledgeable lady in renewable energy. It has been a wonderful journey. Thank you all for giving me this program on a palette of Gold.'

• 'I am highly satisfied with this program; I have learned a lot. I never imagined I would find myself in a program like this. Truly, the engineering field is open to all, no gender inequality.'

• 'I want to use this opportunity to thank our instructors, REA, World Bank, Ceesolar and all the organizations involved in this training, it has impacted a lot of knowledge in us.'

• 'It was such an informative and engaging experience. I feel more confident and equipped to pursue opportunities in the solar industry. I am excited to apply what I have learned and make a positive impact in the field of solar energy. Thank you

to all the organizers of this program, keep up the amazing work'

- 'I really enjoyed the training and during this training on renewable energy, I was also offered a course on renewable energy, due to the exposure to renewable energy due to this training, the course was very simple for me and I got an A in the course. I am so thankful for the training...Thank you so much.'

- 'It was an educative, interesting and engaging experience. I gained a lot and also hopefully looking forward to more opportunities and I can't wait to give back my knowledge to society.... Thank you!'

- 'The EEP STEM program was a very enlightening one that has spurred in me for the renewable energy sector as well as a passion to want to acquire more knowledge in the field. A very big thank to all our sponsors, it was indeed a rare opportunity to learn and develop ourselves,'

- 'To the best of my knowledge the standard of how we learnt was okay the only challenge was combining it with academics. Though we were able to strike a balance.'

09
Lessons Learnt and Recommendations

9.1 Lessons Learnt

Following the successful completion of the student selection process and the training delivery, here are some lessons learnt:

1. **Importance of Mock Sessions:** We conducted mock sessions at each stage of the project and discovered it to be very integral to the project's success. This helped the project team identify possible challenges, both with, student selection, classroom sessions, and online lectures, an d forestall them before they arose. Hence, this is recommended for subsequent projects of this nature.

2. **Importance of a Thorough Selection Process**:
A thorough selection process was essential to getting well-interested students for the program. It was preferred to simple "shortlistment of students" for enrolments into the program. During the training delivery implementation, it was observed that the selection process for students can also be improved upon going forward. It is recommended that in addition to the virtual screening process for shortlisted students, it would be helpful to also have a physical face-to-face interaction with them. This can ensure more completeness in the process of getting well-committed and dedicated students.

3. **Taking into Consideration Departments of Students During Shortlisting:**
The students nominated and selected for the training program belonged to different departments in their institution, it was sometimes difficult to coordinate the different departments and to agree on a schedule that works for everyone. Hence, it is recommended that this should be taken into consideration while shortlisting students for a

similar program in the future, we would recommend that students selected are either shortlisting from a single department, or students selected from different departments are given different schedules and timeslots.

9.2 Recommendations

Based on the feedback received from participants and stakeholders, we outlined the following as recommendations:

1. **Interactive Virtual Sessions:**
Introduce periodic interactive virtual sessions or Q&A forums to further facilitate meaningful interactions between instructors and participants, fostering a more dynamic and engaging learning atmosphere.

2. **Real-World Application Workshops:**
Expand practical application components, such as assignments and projects, by introducing workshops or case studies that directly apply theoretical knowledge to real-world scenarios, enriching the learning experience.

3. **Diversify Reading Materials:**
Diversify the range of readings and resources by incorporating a broader spectrum of materials, including industry reports, case studies, and emerging research, to provide participants with a comprehensive understanding of renewable energy.

4. **Individualized Feedback Sessions:**
Implement a system for individualized feedback sessions, allowing participants to receive specific guidance tailored to their progress and learning styles, fostering a more personalized learning journey.

5. **Professional Development Opportunities:**
Establish pathways for participants to engage in ongoing professional development, potentially through webinars, industry networking events, or additional specialized courses, to support their continuous growth in the field.

6. **Stakeholders Engagement:**
It is also recommended that for future projects of this type and magnitude, with many stakeholders, there is a proper introduction of all stakeholders, most especially in the form of a meeting, where the roles and responsibilities of all are duly discussed. This can help in ensuring more synergy and collaboration during the project delivery.
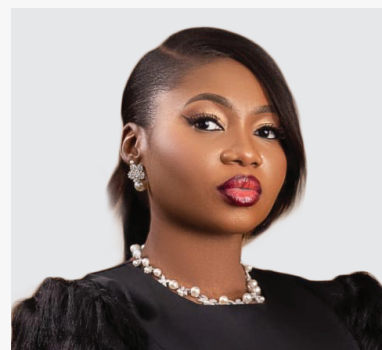
Energizing Education Program (EEP) Phase II Team

Managing Director/Chief Executive Officer (MD/CEO)
Rural Electrification Agency (REA)
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Head Project Management Unit (HPMU)
Nigeria Electrification Project (NEP)
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