

# Training outline for upskilling of trainers in the design of online experiments

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PR3/A1 - Training outline for upskilling of trainers in the  
design of online experiments



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## Introduction

The OLEE project sets itself the aim to assist VET Trainers and learners of the Engineering sector in the transition towards a digital educational & research ecosystem in the post covid-19 era. The concrete OBJECTIVES to be achieved include the following:

- O1: The designing and piloting of innovative online resources. In particular, delivering an Virtual Laboratory for Engineering lab-work activities;
- O2: Reinforcing the ability of VET providers to provide high quality, inclusive digital education;
- O3: The promotion of networking and collaboration between EU institutions, sharing of resources and expertise;
- O4: Support towards the VET communities for the acquisition of digital competences;
- O5: Supporting the Engineering sector & building their resilience & digital capacity.

### I. Expected results of the project

OLEE aims to support VET teachers/ trainers and learners of the Engineering sector in their struggle to navigate the new realities posed to them by covid-19 pandemic and continue their activities in a virtual fit for the digital age. Within this context, the following outcomes, divided in tangible results (TR) and intangible results (IR) are going to be achieved during and on the OLEE project's completion:

#### Tangible Results (TR) >

- TR1: A new innovative training material will be created in OER form, compliant to DigiComp and specifically addressed to the needs of VET trainers and researchers. The training material will be available in 5 languages.
- TR2: Approximately 100 VET teachers/ trainers (12 that will attend the training the certification plus the VET teachers/ trainers and staff from the consortium partners) will directly benefit from the implementation of the OLEE project.
- TR4: An estimated 70 VET providers will benefit from the project results. It is estimated that approximately 60% of the total individuals that will participate in the DigEdu+ training and certification procedure will come from VET centers and will directly benefit from the project results and outputs.
- TR6: Active involvement of education stakeholders and policy makers. It is also expected that each partner will engage 2-3 additional stakeholders during the development of the curriculum and the testing of the product, adding further 12-18 indirect beneficiaries.
- TR7: An innovative virtual learning laboratory for the engineering sector for stakeholders to further utilize.

#### Intangible Results (IR)

- IR1: Creation of a new digital education culture in which VET teachers/ trainers/learners will have a holistic approach regarding the benefits and the new pedagogical approaches in sectors known for testing the waters.
- IR2: VET teachers/ trainers will act as a beacon of change by not only implementing the digital education practices but also promoting them among the educational community and their learners, by supporting inclusivity and fighting in this way the VET early leaving.
- IR3: Creation of new technics regarding the set-up of user friendly and interactive e-learning material
- IR4: An overall upgrade of the e-learning experience though the better understanding of the digital education practices among the VET teachers/ trainers and the new pedagogical technics that are needed.
- IR5: Rendering research and lab activities more user-friendly and inclusive and less costly and unattainable for larger segment of VET learners.

## II. Partner organizations

### AKMI ANONIMI EKPAIDEFTIKI ETAIRIA

The Institute of Vocational Training AKMI was founded back in 1989 and today it is one of the leading Vocational Training Institutes in Greece providing post-secondary education, with more than 37.500 m2 of infrastructure in various cities in Greece, including one of the most highly profiled Campuses in the Country. Every year, approx. 14,000+ active students are enrolled with the aim to study one of the 107 specialties, in more than 340 laboratories offered in 6 cities across Greece.

The fields of study in the campuses of Athens are numerous and in all of them, AKMI SA gives the students tools to collaborate and problem solve, brainstorm and reflect and encourage them to use their passions for good. Apart from the technical part of learning, the experienced educators ensure an inclusive community among the students and cultivate a safe environment, allowing them to open up, discover new directions and ultimately, helping them create a new mindset. With the help of the education that AKMI SA provides, the youth can promote competitive issues like analytical precision, envisioning future scenarios and decision-making.

Social Inclusion and Gender Gap are other important issues which the youth can reform and that way resolve through education. Creating suitable peaceful conditions and working for security are the other developments which the youth can achieve through education. In one word, AKMI SA hopes that with proper education, the youth can become productive, scientific-oriented, broad-minded, and ideal citizens of the society as the society is significantly influenced by this category of people. The abovementioned cities consists of the 80% of the total population in Greece and AKMI S.A. represents almost 60% of total Private VET sector in Greece. It is the most appropriate partner to take on the designing of the study material, the training and the examination of the supervisors.

### COMUNIDAD DE MADRID

Leganés Electricity, Electronics and Aeronautics Training Centre (Madrid) is a public training establishment in the professional family of Electromechanical Machines. Its general purpose is to improve the professional training of workers in the region, primarily unemployed, through personalized and specialized training with a high practical content and complete it with the active support of the job search. The courses being taught are aimed at facilitating the obtention of “Certificates of Professionalism” (shorter studies and focus exclusively on the contents of the certificate) and acquiring or developing professional skills to improve employability in the industrial sector. It also offers courses for the upskilling of trainers, which are basically related with innovative fields such as remote monitoring of installations and cybersecurity in industrial facilities. Labelled as a “National References Centre” (CRN as per its Spanish acronym), our centre is at the service of the professional training system, both in the field of education and employment, to meet the changing demands for qualifications from productive sectors. The centre carries out innovative, experimental and training activities serving as reference to the whole national system of qualifications and vocational and adult training for the development of VET in Spain, in particular towards continuing VET, to enable skilling, upskilling and reskilling. The Centre is located in Leganés (Madrid) and it has unique facilities for the development of training activities, as well as equipment and machinery, which make it an exceptional centre not only on a national level, but also on a European level. In addition, the Centre has innovative technology, such as domestic and industrial automation machinery, for the realisation of training exercises prior to the handling of machinery, which allow the simulation of operations through virtual means, thus optimizing the training provided and reducing the risk of accidents.

### BK CONSULT

BK Consult GbR is a niche service provider, with vast -over 20 years- experience in Project Management and service delivery. BK Consult GbR covers the thematic fields of:

- Education, including the design and delivery of Training Curricula, using state of the art methodologies (TNA, DACUM, EU Competence Frameworks, EQAVET, EU Credit systems, Learning Agreements, Evaluation through the creation of feedback loops), and smart ICT and other tools like elearning through MOOC platforms, gamification, experiential education.
- Employment, either as facilitators through the support of start-ups and entrepreneurship, or through the effective upskilling and reskilling of employees and unemployed, according to the actual market needs. Areas of services provided cover the design and implementation of market needs analysis, the conduction of tracer studies, ALMPs and the introduction of WBL and apprenticeship schemes at a sectorial or country level.
- Social Inclusion, targeting vulnerable groups, including single parent families, long-term unemployed, minority groups, TCNs (migrants, refugees, asylum seekers) and tackling of discrimination of any kind (gender based, sexual identity). Within this context, BK Consult GbR is providing services that include:
  - Formulation of Partnerships that can make a difference and increase impact
  - Project Management at Local, National and EU level, according to the PMP methodologies
  - Evaluation of Projects and Programmes
  - Quality Assurance of Deliverables and Project Outputs

- Capacity Building from grass-root organizations to HEI
- Design and implementation of mobility across the EU and other Programme Countries Being founded in 1993, and operating since 2019 as a GbR

In the field of Employment policies, having participated in various Policy Making Projects, in BK Consult GbR we can provide support in various areas, covering:

- Design and implementation of ALMPs
- Diagnosis of labour market needs at a sectoral and national level
- Design and implementation of tracer and GSTS studies for Educational Providers
- Design and delivery of effective Work Based Learning and apprenticeships schemes being a productive member of EafA
- Skills gap analysis at a local, regional, national, and cross-border level.
- Design and delivery of Occupational Profiles
- Country reports on employability, including the delivery of policy recommendations

Finally, BK Consult GbR at an EU level is considered experts in the creation and management of CoVEs, creating state of the art learning solutions.

#### GR EUROCERT SRL

Eurocert SRL is an Independent Third Party Inspection and Certification Body with a National, European & International range of activities and broad range of scientific disciplines. It was founded by Greek scientists with extensive experience in Audits and Inspections. Eurocert SRL operates in the following areas: 1. Management Systems Certification 2.

Certification of Products Requiring CE Marking 3. Performing statutory periodic inspections of industrial items. At the same time, it has a significant presence in the field of inspections in the field of Shipping, in the Greenhouse Gas Emissions Verification and waste management. Having the required know-how, it provides services of high quality and value. This is achieved by the optimal use of well-trained and certified scientific staff (specialized engineers, agricultural engineers, veterinarians, captains) who, due to their extensive experience, add value to the conduct of inspections. Eurocert SRL has earned the trust of its customers, with the result that it has issued more than 3000 certificates, leading a leading position in the field of inspections and certifications. Eurocert SRL is a Certification Body accredited in Greece by ESYD – the National Accreditation System - for 45 services of audits, including ISO 9001, ISO 14001, OHSAS, Social Responsibility, HACCP, ISCC, Elevators and Pressure Equipment. Eurocert SRL is the first certification body in Greece to have been accredited by the National Accreditation System for Quality Management Systems (ISO 9001: 2008), Environmental Management (ISO 14001: 2004 KAI EMAS), Food Safety (ISO 22000:2005), Health and Safety (OHSAS 18001, ELOT 1801), Integrated Management (AGRO 2.1 & 2.2 and AGRO 3), ELOT 1429 Managing Proficiency, Good Agricultural Practice (GLOBALGAP V4) and by UKAS for the implementation of the IFS Protocols in Greece and Romania and as the Verification Body for Emissions of Greenhouse Gases. It operates internationally in 25 countries with 300 auditors and 30 executives. In its monthly payroll there are 80 persons, all of higher education, engineers, environmentalists,

geologists, chemists, VETS, agriculturists and economists. All the stakeholders are committed to act upon independence, impartiality and compliance to the European standards requirements. The customers are large, medium, small and very small companies of public or private interest in agricultural, manufacturing or services sector. Its major customers are cement producers and energy companies. Moreover, the company also operates as Academy, a training institution for professionals in Quality Systems and a Profession Certification Body.

### NEWPORT GROUP

Newport Group is one of the largest private education providers in Slovakia. The company offers training programs in the field of VET, as well as professional education, lifelong learning, and accredited teacher education. Newport Group offers a portfolio of accredited training programs with a significant share of practical training with elements of dual and continuous education. This ensures development of key competences and skills necessary for innovative technologies in the production environment. From mechatronics, CNC programming to automation and mechanical engineering. Accredited educational programs are based on German standards set by the Federal Institute for Vocational Education and have undergone an accreditation process under the Lifelong Learning Act in Slovakia. Our clients include Volkswagen, Jaguar Land Rover, Continental, Peugeot-Citroen, Kia, and many other manufacturers in the automotive and engineering industries in Slovakia. Since 2017 we have had more than 16,000 active participants in our courses who have been studying one of 14 specializations, or a general vocational training course. We also bring a portfolio of training courses focused on the development of personal skills and competences in a modern and interactive form with a focus on the effectiveness and quality of education, while simultaneously combining the requirements of Human resources specialists as well as of the participants. Thanks to this type of education, we serve not only large companies, but also small and medium-sized enterprises. Newport Group is together with Volkswagen Slovakia and Siemens Slovakia and the Bratislava self-governing region a co-founder of the Dual Academy - the most modern secondary vocational school in the Bratislava region, which focuses mainly on teaching mechatronics and autotronics. It employs 40 professionals and teachers. Thanks to cooperation with employers and the transfer of foreign know-how, we are able to develop our offer of modern, effective, and practice-oriented courses. Thanks to the high employability of our graduates, we have confidence of our partner companies, Labour offices and Employers' associations. Our company is a member of the Association of employers' federations and associations of the Slovak Republic, the German-Slovak Chamber of Industry and Commerce, and the Slovak Chamber of Industry and Commerce. Our colleagues and employees are members of many professional groups that work with state institutions to improve the quality of VET in Slovakia.

### EUROPAISCHER VERBAND BERUFLICHER BILDUNGSTRAGER (EVBB)

The birth of EVBB - Europäische Verband Beruflicher Bildungsträger - dates back in the Nineties, when the first vocational education institutes in Germany decided to join forces in order to address the challenges that a quickly changing sector was confronting them with. Completely renewed in 2010, today the European Association of Institutes for Vocational Training is an umbrella association gathering an heterogenous range of educational providers in the common interest of enhancing, upgrading and harmonising Vocational Education and Training (VET) at European level. In accordance with its Statutes, the duty of the European Association of Institutes for Vocational Training promotes youths and adults alike in the following areas:

- providing a liberal education in terms of social, economic and sociopolitical issues taking particular consideration of European policies and policies towards the developing world based on a socially binding, liberal economic and social order,
- promoting technical, vocational or industrial qualification, continuing education and advanced training in addition to retraining,
- providing scientific education,
- providing education with regard to personal or family issues,
- promoting qualification, continuing education and advanced training in the fields of geriatric care, work with the disabled and nursing services,
- developing media and its use,
- promoting environmental qualification. EVBB mission lies in breaking down traditional hierarchies between VET and higher education and promoting the qualitative improvement of vocational schools and training and in promoting VET as a first choice. EVBB has more than 60 members from all over the world coming from both the private and the public sector and covering all fields related to initial, advanced and further education and training. Beyond that, the European Association of Institutes for Vocational Training (EVBB) has set the following tasks for itself:
  - It takes a stand on the fundamental questions of vocational training and encourages the advancement of positions at EU level.
  - It represents the common interests of its members and the European institutes in public and in front of national and supranational authorities, the European Parliament, the European Commission, European institutes and national institutes and authorities.
  - It promotes cooperation among its members and encourages building networks between them, organizing vocational education in the member states and at a European level.
  - It sets up quality criteria for the work in vocational education to which all members are bound.
  - It organizes national and international specialist conferences at which the future prospects for vocational education and training are worked out, positions and points of view and the examples for successful projects in national or European policies are presented as good practice.
  - Workshops, courses and seminars are conducted within the scope of the EVBB's own European projects and those of its members.
  - Together with the Adalbert Kitsche Foundation, the EVBB awards at its annual conference the "DIE EUROPA" Prize for innovative projects to promote disadvantaged youths. Neither politically nor denominationally affiliated, EVBB strives for a borderless, pluralistic and fulfilling education as an essential means to shape our democracy and society. Its activities are not focused on business operations or making a profit. It serves solely and exclusively non-profit purposes within the meaning of the General Fiscal Law as it is valid in the Federal Republic of Germany. EVBB's permanent



staff is based in the EU headquarters so to keep on a close on-going dialogue with EU institutions.

### INFORMATION TECHNOLOGY FOR MARKET LEADERSHIP

Founded in 2011, Information Technology for Market Leadership IKE (ITML) is a global ICT enterprise headquartered in Athens, Greece. ITML provides novel, tailor-made software solutions based on a variety of technologies, such as big data analytics, advanced data mining and machine learning. ITML's vision is to deliver tailor-made software solutions (products and services) close to the real customers and market needs, ultimately improving the user experience and the access to technology. ITML solutions cover a very wide range of applications, including e-shops, e-learning, Business Process Management (BPM), or any other customized application. ITML particularly delivers solutions through bilateral projects with private industry, Public-Private Partnerships (PPP), EU and beyond-EU funded projects, and nationally-funded projects. It has active participation in numerous H2020 projects as technology provider and system integrator in the fields of:

- Tailor-made cybersecurity services · Internet of Things
- Machine Learning-based Big Data Analytics
- Smart Transportation · Smart Production Digitisation
- Energy efficient smart city applications ITML is currently employing 13 Staff and 20 free-lancers of multiple backgrounds, from IT and software engineering to sales and social sciences.

### III. **Upskilling of trainers in the design of online experiments**

Nowadays, education is changing rapidly and with it the teaching methods. Traditional methods are still important, but online tools offer new possibilities and innovative approaches to learning. Here are some examples of new teaching methods where we can make effective use of online tools:

1. Online experiments in VET - online experiments are interactive learning tools used in VET (Vocational Education and Training) to simulate real work processes and explore scientific concepts. Using online experiments, students can learn practical skills, develop critical thinking and problem solving in a safe and controlled environment. Types of online experiments in VET:

- Simulations: these experiments mimic real work environments and allow students to practice skills and procedures without the risk of injury or equipment damage.
- Interactive Exercises: these exercises present students with problems and tasks to solve using online tools and simulations.

- Data collection: students collect and analyze data from real or simulated experiments to learn about scientific concepts and principles.
  - Virtual labs: these experiments allow students to do lab work remotely using a computer and the Internet.
2. Flipped Classroom: in this method, students familiarize themselves with new material online before the lesson, for example by watching videos, reading articles, or solving online tests. During the lesson, they then engage in discussion, activities and solving problems related to the topic covered. Online tools such as YouTube, Khan Academy, and EdX offer a rich supply of materials for various subjects.
  3. Gamification: gamification is the use of game elements in a non-game environment. It is used to motivate students and make learning more attractive. Online tools such as Kahoot!, Quizizz, and Classcraft allow you to create interactive quizzes and games that students play individually or in teams.
  4. Problem-based learning: problem-based learning emphasizes active problem solving by students. Online tools such as Google Earth, GeoGebra, and PhET Simulations allow students to explore different concepts and solve problems in an interactive and visually engaging way.
  5. Cooperation: online tools such as Google Docs, Padlet, and Mural allow students to work on projects together in real time, even if they are in different locations.
  6. Personalized learning: online tools such as Khan Academy, Knewton, and KnewYou allow students to learn at their own pace and according to individual needs. These tools provide students with personalized learning materials and feedback.

### **The relevance of online experiments in VET**

Although traditional methods of professional teaching have proven themselves, nowadays, with constant progress and digitalization of the working environment, it is necessary to introduce innovative tools. Online experiments are an increasingly important part of VET because they offer unique advantages for both students and institutions.

### **Why are online experiments in VET so relevant?**

- A safer environment: online experiments allow students to practice skills and procedures in a safe and controlled environment. Unlike real work activities, which can be potentially dangerous, the online environment eliminates the risk of injury and equipment damage.

- **Cost reduction:** online experiments are a cheaper alternative to traditional laboratories that require expensive equipment, consumables and premises to maintain. Institutions can save on operating costs while offering students modern learning tools.
- **Increased accessibility:** online experiments are available to students anytime and from anywhere as long as they have an internet connection. This allows for more flexible learning and adapts to the individual needs of students, who can study at their own pace and at a time that suits them best.
- **Engagement and interaction:** online experiments often feature interactive elements, simulations, and visual aids that increase student engagement and improve their interest in the subject matter. An engaging environment supports a better understanding of the issue covered.
- **Development of practical skills:** online experiments offer students the opportunity to practice practical skills in a simulated work environment. After completing online experiments, students will be better prepared to handle real work activities.
- **Preparing for digitized workplaces:** many modern workplaces use various digital tools and technologies. Online experiments introduce students to a virtual environment and help them develop digital skills that are in high demand in today's job market.

Examples of the relevance of online experiments in various fields:

- **Medical:** medical students can learn to use medical equipment and perform medical procedures in a simulated hospital environment.
- **Auto repair shop:** mechanics can diagnose and repair engine problems in a realistic auto repair shop simulation.
- **Electrical engineering:** electricians can practice testing electrical circuits and troubleshooting in a simulated home environment.
- **Chemical industry:** future chemists can collect and analyze data from chemical experiments and learn about chemical reactions in an online lab.
- **Engineering majors:** welders can perfect their techniques in a safe virtual environment that simulates a welding shop.

### The Role of the teacher in online experiments

While online experiments offer significant advantages in VET, the role of the teacher remains crucial in ensuring their effectiveness. Here's how teachers can contribute to a successful online experiment experience:

1. Preparation and Design:

- Selection and Integration: teachers play a key role in selecting online experiments that align with learning objectives and effectively complement traditional teaching methods.

2. Guidance and scaffolding:

- Teachers can develop pre-experiment activities and instructions to prepare students for the online environment and the specific tasks involved.

3. Delivery and Facilitation:

- Introduction and context: teachers can introduce the online experiment by explaining its purpose, connecting it to the broader learning objectives, and addressing any technical requirements.

4. Monitoring and Support:

- Teachers can monitor student progress during the experiment, offering support and guidance if needed. This can be done through online forums, chat functionalities, or individual communication.

5. Evaluation and Reflection:

- Formative assessment: teachers can use the online experiment data and student responses to gauge understanding and identify areas where additional explanation or practice might be needed.

6. Discussion and Debriefing:

- Teachers can facilitate post-experiment discussions to deepen student understanding. This can involve encouraging students to analyze data, interpret results, and draw connections to real-world scenarios.

7. Additional Considerations:

- Technical Support: teachers can provide students with resources or training to ensure they have the necessary technical skills to navigate the online experiment platform.

## 8. Motivation and Engagement:

- Teachers can use online experiments as a springboard for further learning and exploration, keeping students motivated and engaged throughout the process.

By actively participating in the online experiment process, teachers can maximize their benefits for VET students. They act as facilitators, guides, and evaluators, ensuring a well-rounded learning experience that combines the advantages of online technology with the essential guidance of a skilled educator.

### **A Deep dive into effective implementation**

The rise of online experiments in VET presents a unique opportunity to enhance student learning. However, simply incorporating these experiments isn't enough. To unlock their full potential, we need to delve deeper into the role of the teacher, explore the nuances of implementation, and establish pedagogical best practices.

### **Theoretical and methodological aspects: framework for success**

While the benefits are clear, integrating online experiments requires careful planning and consideration of several key aspects:

1. **Alignment with learning objectives:** the chosen online experiments should seamlessly integrate with existing curriculum goals. They shouldn't be standalone activities but serve as tools to reinforce specific concepts, skills, or knowledge areas.
2. **Embrace pedagogical approaches:** different learning theories inform teaching practices. Consider how online experiments can support specific pedagogical approaches, like constructivism where students actively build knowledge through exploration, or problem-based learning where they solve real-world scenarios.
3. **Technical considerations:** technological barriers can hinder learning. Before implementation, ensure students have the necessary hardware and software to access the online experiments. Invest in basic training to familiarize them with the platforms and functionalities.

### **Pedagogical conditions for studying physics in VET: Case Study**

Physics forms the foundation of many VET programs. Here's how online experiments can revolutionize physics education:

- **Pre-Experiment activities:** before diving into the online simulation, teachers can introduce key concepts through engaging activities or pre-recorded videos. This equips students with the necessary background knowledge to navigate the experiment effectively.
- **Interactive Learning at the forefront:** encourage students to actively engage with the online experiments. Instead of passively observing, have them manipulate variables, analyze the impact of their actions on the simulated system, and draw conclusions from the data generated.
- **Post-Experiment debriefing - deepening understanding:** don't let the experiment end with the final click. Facilitate discussions to solidify learning. Students should interpret data, connect the findings to real-world applications in their chosen field, and identify areas needing further exploration. This collaborative process fosters critical thinking and reinforces learning.

### **Peculiarities of using online experiments in VET: tailoring the experience**

While the benefits are universal, there are some nuances to consider when using online experiments in a VET setting:

- **Focus on practical applications:** unlike general science education, VET emphasizes practicality. Online experiments in VET should explicitly showcase how concepts and principles apply to students' chosen vocational fields.
- **Scaffolding learning - building confidence:** transitioning to online experiments can be challenging. Teachers should provide ongoing support and guidance, especially in the initial stages. This can involve providing step-by-step tutorials, offering individual assistance, and creating a collaborative learning environment where students can support each other.
- **Developing digital literacy - bridging the gap:** not all students are equally comfortable with online learning platforms. VET programs should integrate digital literacy training to equip students with the skills needed to navigate online experiments confidently.

### **Activities for teachers and students: optimizing the learning journey**

Teachers play a crucial role in maximizing the benefits of online experiments. Here are some ways they can create a dynamic learning environment:

- Individualized learning: teachers can leverage the flexibility of online experiments by tailoring the selection to individual student needs and learning styles. Students struggling with specific concepts can benefit from targeted experiments, while fast learners can delve deeper into more complex simulations.
- Collaborative learning - building teamwork: encourage students to work together on online experiments. This fosters teamwork, communication skills, and problem-solving abilities, all vital for success in today's workforce.
- Formative assessment - driving Improvement: use data generated by online experiments and student responses to assess understanding and identify areas for improvement. This allows for timely interventions and personalized feedback, creating a learning environment that promotes continuous

#### IV. OLEE - Functional Requirements

The Online Laboratory for Engineering Education (OLEE) is a digital platform funded by the European Union designed to provide vocational education and training in the engineering sector. It offers features like a virtual laboratory, training material, self-assessment tools, and progress tracking to provide an immersive learning experience for learners. Use cases include navigating to the home page, signing up for the application, logging in, conducting experiments, reviewing progress, and completing self-assessment quizzes. The platform aims to bridge the gap between traditional and digital education in the engineering sector.

#### Key Insights

- OLEE provides a realistic virtual lab environment for learners to conduct experiments remotely.
- The platform offers comprehensive training materials and self-assessment tools for an interactive learning experience.
- Trainers can track learners' progress and modify experiment details to enhance the learning experience.
- Use cases detail how users can navigate the platform, conduct experiments, and interact with learning materials.
- The platform's focus on vocational education and training in the engineering sector aims to make learning accessible and engaging.

#### Frequently Asked Questions

1. How does OLEE differentiate itself from traditional education methods?

OLEE offers a virtual lab environment, interactive learning materials, and progress tracking, providing a more immersive and engaging learning experience compared to traditional methods.

2. What features does OLEE provide for trainers to monitor learners' progress?

Trainers can access trainee profiles, review experiment progress, and modify experiment details to enhance the learning experience for learners.

3. How can users interact with experiments on the OLEE platform?

Users can conduct experiments in a 3D virtual environment, complete tasks, receive feedback, and take self-assessment quizzes to assess their understanding.

4. What types of experiments and training materials are available on the OLEE platform?

OLEE offers a wide range of experiments in the engineering sector, along with theoretical resources, training scenarios, and self-assessment tools to support learners' educational needs.

### **Technical Requirements**

This text discusses the technical requirements for the Online Learning Engineering Environment (OLEE) project funded by the European Union. It covers aspects such as the proposed technologies, database structure, 3D virtual lab environment, system functional and non-functional requirements, user roles, and project management methodology.

### **Key Insights**

- The project utilizes a popular CMS like WordPress for content management, offering advantages in user and role management.
- A relational database system, MySQL, is chosen to store experiment data, including 3D models, tasks, self-assessment questions, and user responses.
- The 3D virtual lab environment is implemented using Unity, enabling interactive simulations and object manipulation.
- User roles are defined as Administrator, Trainer, and Trainee, each with specific access levels and responsibilities.
- Agile methodology, specifically Scrum, is recommended for project management, emphasizing adaptability and continuous improvement.

### **Roles defined in the OLEE project**

User roles in the project are defined as Administrator, Trainer, and Trainee, each with distinct levels of access and responsibilities.

### **Database system used**

A relational database system, MySQL, is utilized to store various resources for experiments in the OLEE project.

### **3D virtual lab environment**

The 3D virtual lab environment is implemented using Unity, allowing for interactive simulations and object manipulation.



### **Recommended project management methodology**

The Agile methodology, specifically Scrum, is recommended for project management in the OLEE project to ensure adaptability, continuous improvement, and customer satisfaction.

#### **V. Certification for the award of a label of "Virtual Laboratory for educational skills in VET institutions"**

Each Institution can create new modules in the OLEE platform. The initial certificate awarded when an Institution registers for the OLEE label certification, includes only the OLEE modules adapted by the Institution at that time. In the case an Institution wishes to adapt more from the available modules or create and insert new modules, at a later time, then the following steps are needed:

1. To create or modify the documents initially submitted as part of the Institution's assessment for the initial certification, to include descriptions and records for the additional modules.
2. Register for an assessment again
3. Upload and submit the new documents in all fields.
4. Then they will be again reviewed and a new certificate will be issued by the reviewer.
5. The certificate will then be sent the web site administrator to update the list of certificate holders