E-FORUM: MANAGING PANDEMIC CHALLENGES AND OPPORTUNITIES OF TVET IN THE ERA OF DIGITALISATION

IN CONJUNCTION WITH THE 32ND SEAMEO VOCTECH GOVERNING BOARD MEETING

28 OCT THURSDAY | 9.00AM - 5.00PM BRUNEI TIME (GMT +8) | VIRTUAL VIA ZOOM & YOUTUBE

SEAMEO VOCTECH
"Preparing TVET for Industry 4.0"

Industry Perspectives in Ensuring a Resilient TVET during a Pandemic and in the Era of Digitalization

Dr. Steven McKee,
President of Labtech International
President Emeritus, Worlddidac
www.worlddidac.org
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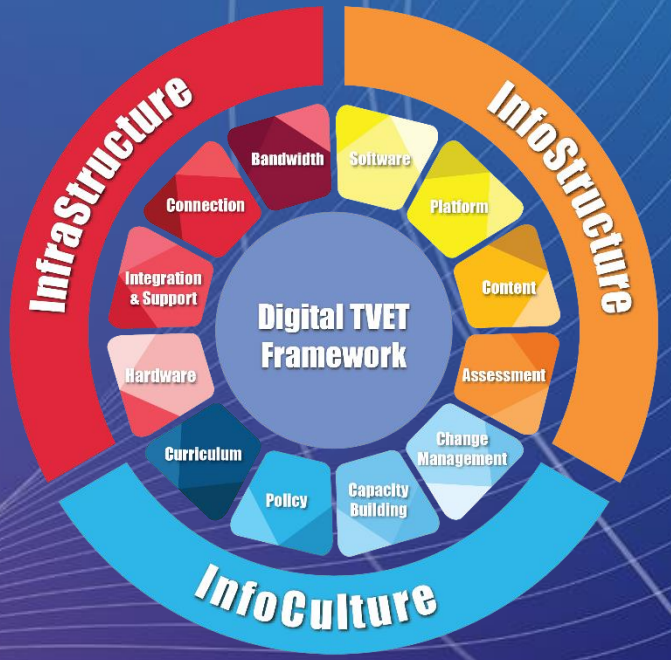
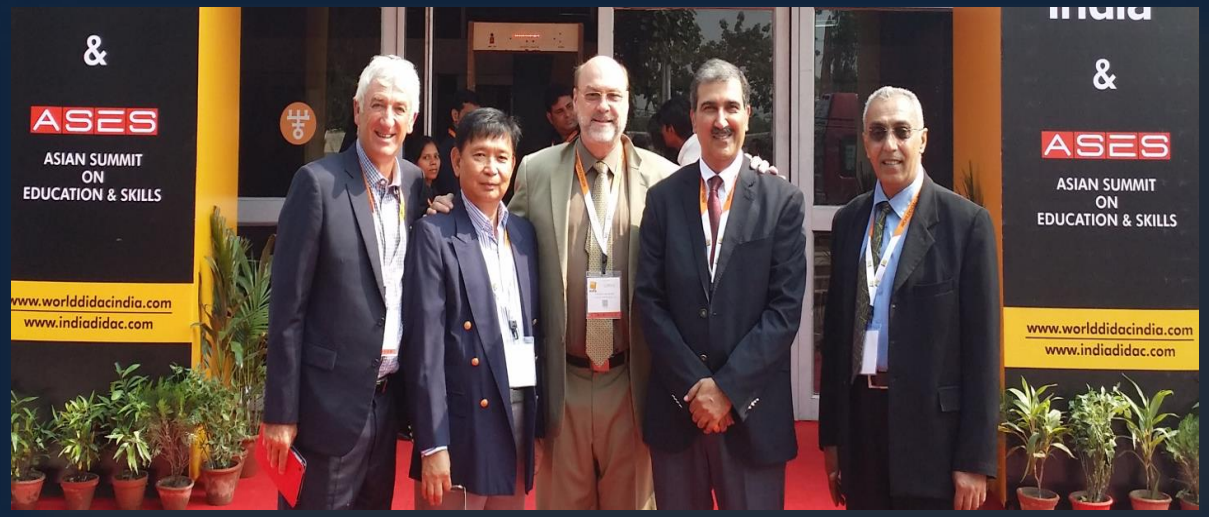
www.labtech-academy.com



LABTECH INTERNATIONAL LTD.

"The International Technical Education Company"



- Labtech is one of the leading **Technical Vocational Education & Training Manufacturers and Designers** in the world.
- Labtech is noted for using **Western Educational approach and Technology** while **adapting it to individual country requirements** and focuses on employable skills training (VET and TVET)
- Labtech production base is in Batam, Indonesia and ensures all the products are well **designed for Technical Education and Employable Skills training**.
- Labtech are also leaders in **digital learning for TVET** and have created their **Virtual TVET program** which uses realistic interactive 3D advanced gaming technology for Teaching and learning

PRODUCT TECHNOLOGY AREAS
Over 1,000 Physical Training Systems and Interactive 3D Digital Learning

QUALITY

INNOVATION

RELEVANCE

EMPLOYABILITY

Current digital training (Labtech Virtual TVET) programs in USA, Peru, Columbia, South Africa, Jordan, Pakistan, India, Malaysia, Kenya, Thailand, Philippines.

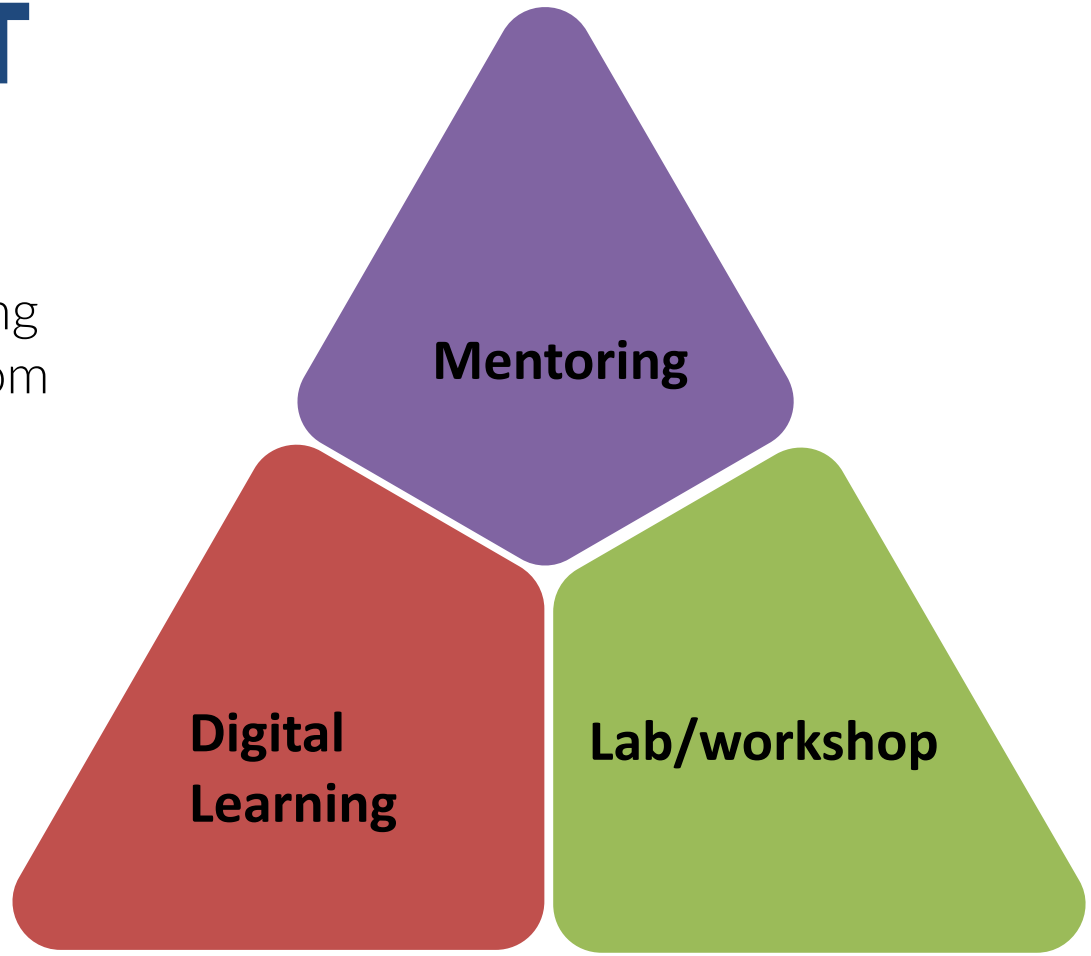
www.labtech.org

Labtech Training Systems are used in over 85 countries world wide and indicated in BLUE on this map. We also have 6 regional operational location marked with a flag.

Digital Learning as the Third Pillar For TVET

The in-school Blended Learning landscape can change with digital learning and free up more time from the teacher to guide and mentor the student.

Mentoring
Teachers will have more time for guiding the students



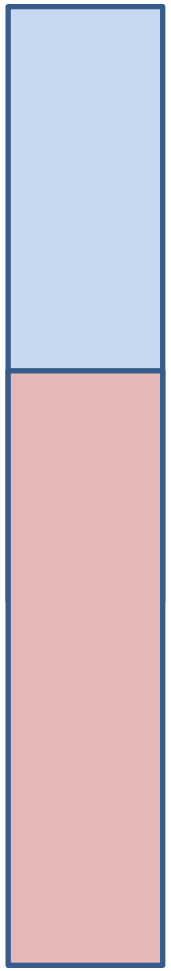
Digital Learning
Providing most **theory** and demonstrating **applied use of technology**
Pre-Lab preparation

Lab or Workshop
For Practical work and exercises – **Lessons occur about 25% faster**

Assessment

Summative Assessment – for final grades

Formative Assessment – for boosting understanding and retention real time immediate feedback



How can industry players contribute tools and resources to ease pandemic changes and transitions in TVET?

- Find Stronger Ways of collaborating for Industry - Education
- Digital Learning platforms have the potential to link industry and learning in ways not able to be done before.
- Link and articulate In-School Learning with Apprentice Programs at industry.
- Training and upgrading for existing Employees
- Linking job searches with training requirements so as to provide access for people to upgrade their skills.
- All these can help to reduce the skills mismatch issue
- New Report from ILO on upskilling and reskilling

Global new report from the ILO on:

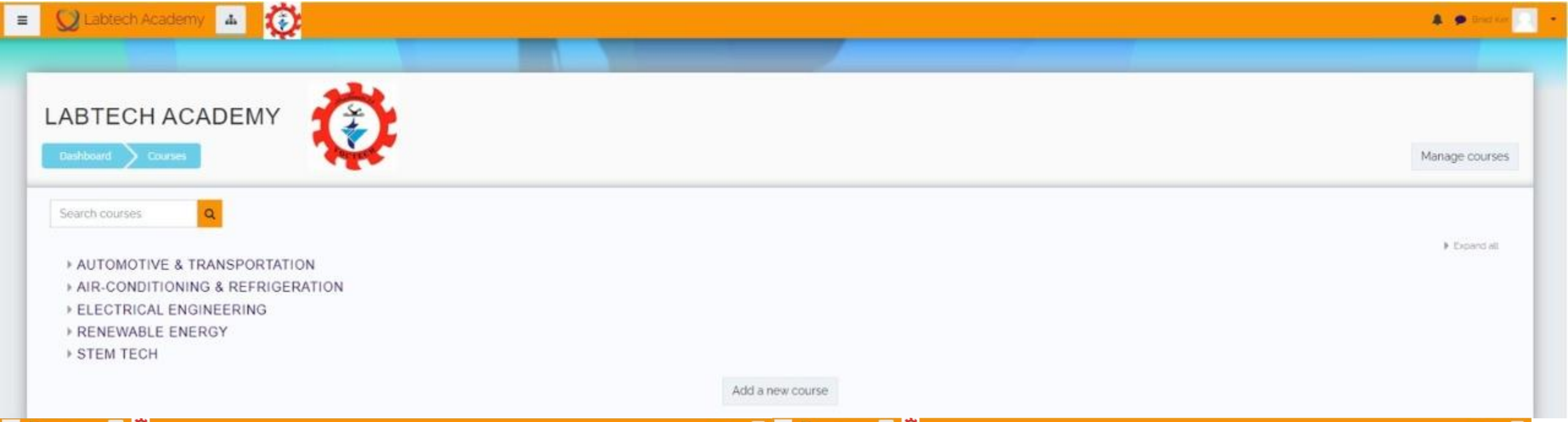
- **Skilling, upskilling and reskilling of employees, apprentices & interns during the COVID-19 pandemic**

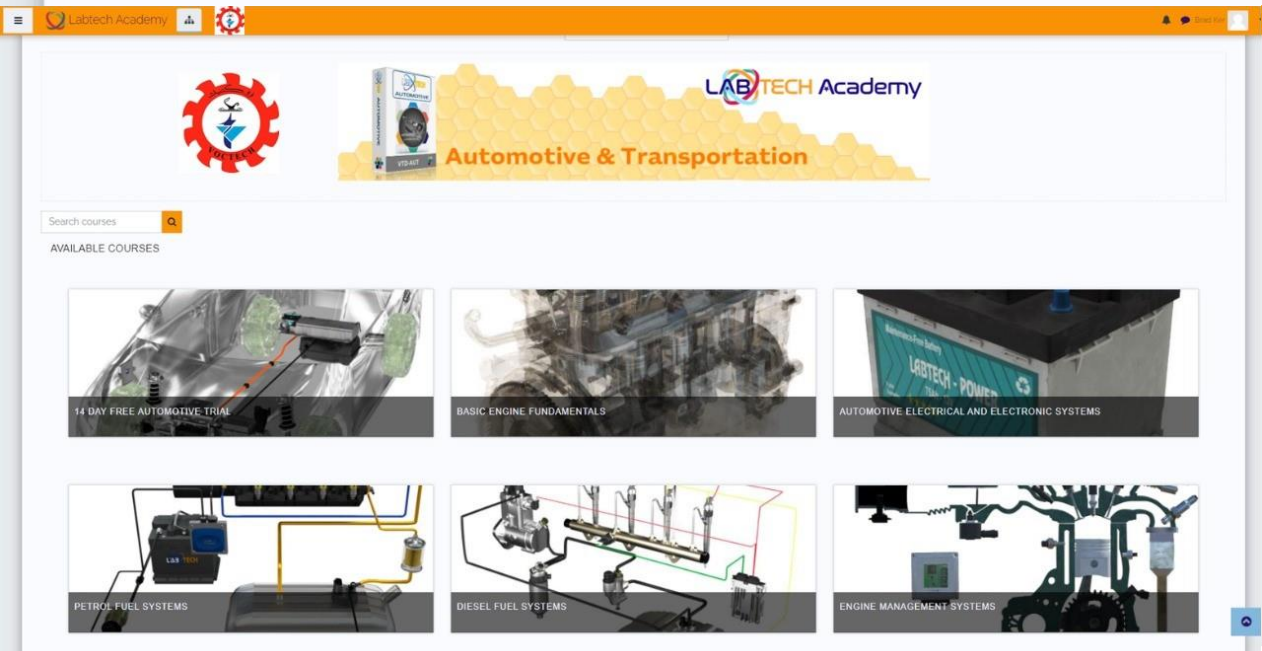
Findings from a global survey of enterprises

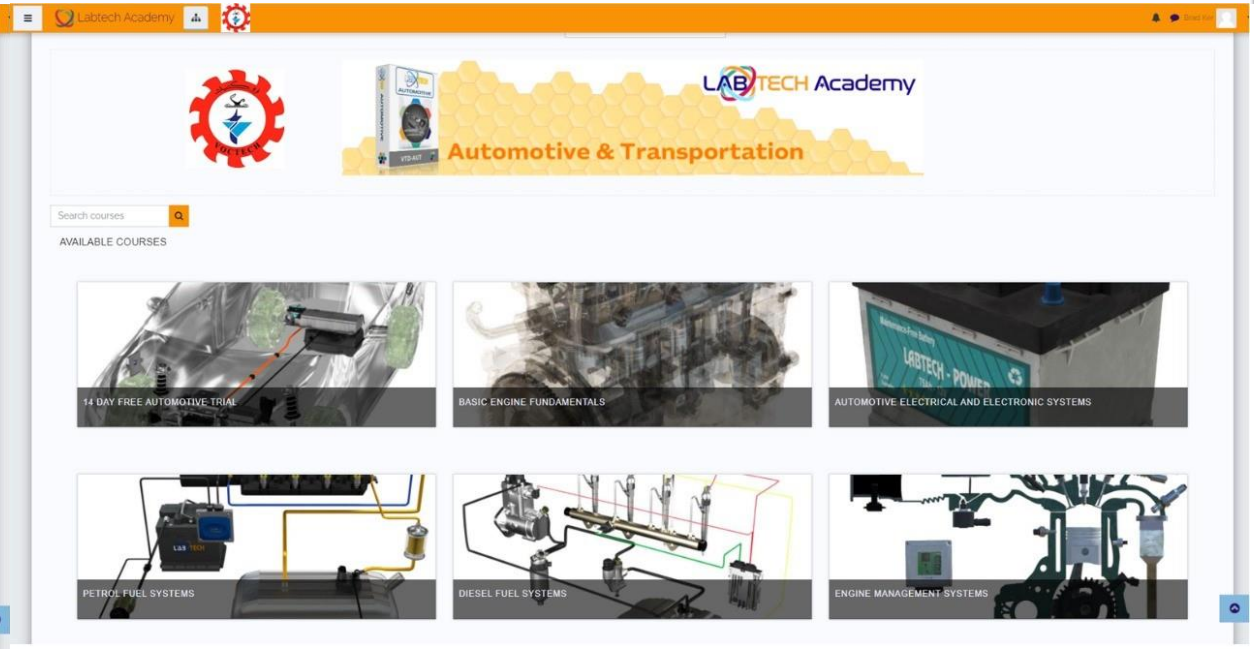
https://www.ilo.org/skills/areas/work-based-learning/WCMS_794569/lang--en/index.htm

- Special Portal for TVET Content for online learning for ASEAN member countries
- Teacher Training and Capacity Development Courses
- Webinars on selected topics about Digital Learning
- Workshops on refining and developing the Digital TVET Framework
- Research into digital learning for TVET and collaboration programs

SEAMEO – Labtech Academy Learning Portal - for teachers and students





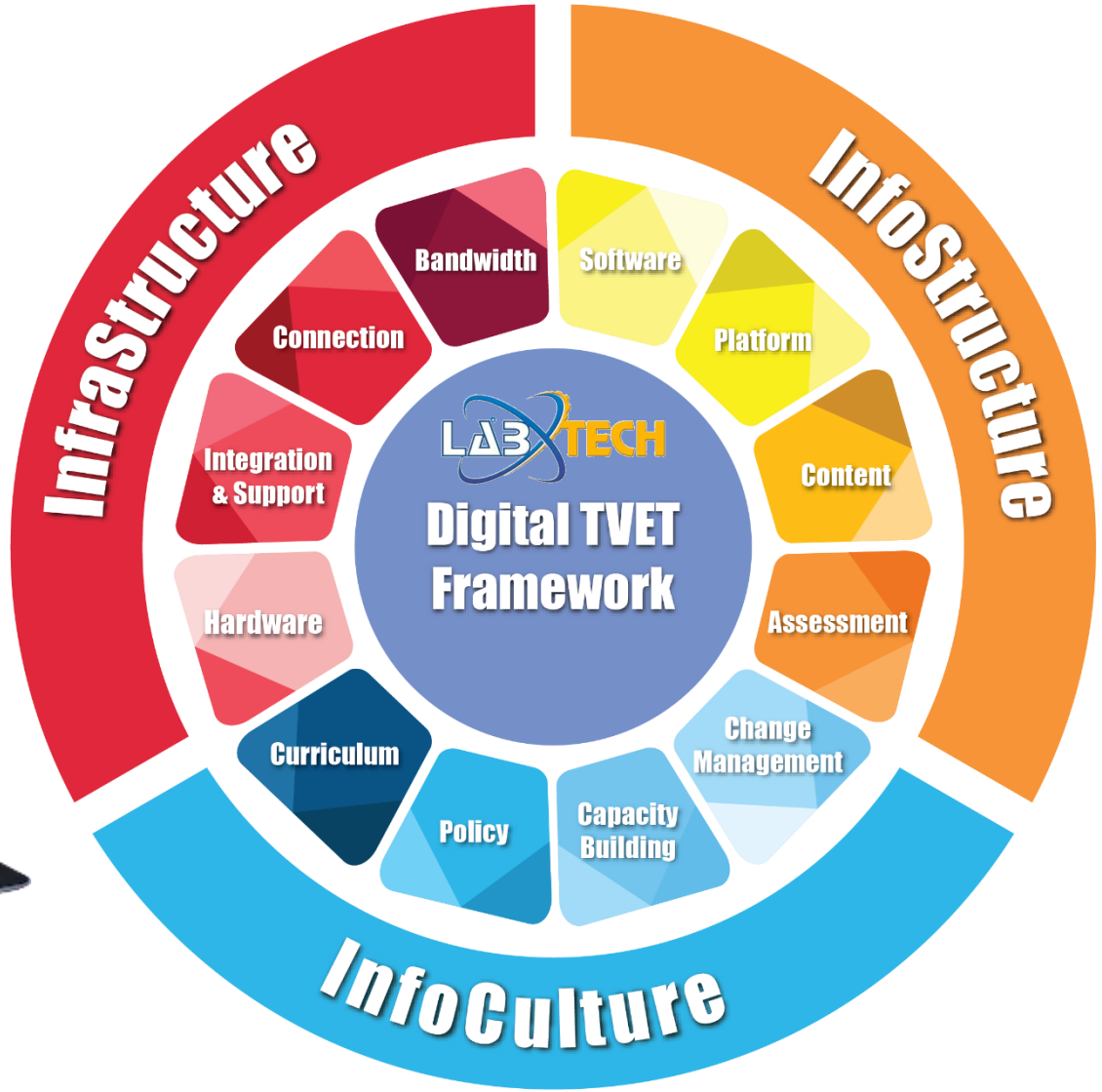


DIGITAL TVET FRAMEWORK –Workshop
Adapting Digital Learning each country's needs

1. Examine requirements and understand the issues
2. Setting Objectives and Goals
3. Assessing where you are – Self assessment
4. Identify what needs to be done – Gap Needs Analysis
5. Adapt and Implement program to match needs

Its not about Hardware any longer, it is about content and delivery platforms and Capacity building.

Remember digital learning will require a continuous development process and it will develop over time. It can be done step by step within your resources



What are some trends in digital TVET that are suitable to implement in Southeast Asia?

- Collaborate with developers of both platforms and content. The wheel does not have to be reinvented.
- We need a Regional Center of Excellence for Digital and Blended learning for ASEAN for TVET.
- Create National Centers of Excellence for TVET Digital and Blended Learning in each country
- Increase Capacity Building and Teacher Training Programs
- Labtech recent cooperation with CPSC for upgrading teachers in digital and online learning. This series will continue to be developed and offered together with SEAMEO Voctech.

Training

Program

TRAINING PROGRAM OUTLINE

- **Session 1 (4 Hours) – Digital TVET Framework and What is Virtual TVET**
- **Session 2 (4 Hours) – Navigating around the TVET LMS and Reporting**
- **Session 3 (4 Hours) – Creating a Lesson Plan using Virtual TVET**
- **Session 4 (4 Hours) – Ongoing Professional Development (Coaching)**

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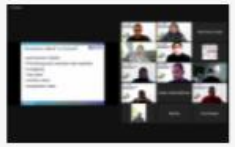
UTHM-LABTECH DIGITAL INNOVATION CENTRE

UTHM-LABTECH

DIGITAL INNOVATION CENTRE

PUSAT INOVASI DIGITAL

GALLERY



LATEST INFO

Collaboration Meeting with Lenovo Malaysia

Discussion on future collaboration and partnership.

Collaboration between Industry and TVET Institution

- Name of Lab: **UTHM-LABTECH Digital Innovation Centre (DICE)**

- Known as the **“Centre of Industry (CoI)”** project.

- **Objectives:**
  1. To establish a fully functional Digital Innovation Centre in UTHM.
  2. To conduct trainings on capacity building including hardware, software and new technology.
  3. To conduct research, development and innovation in creating new TVET digital contents.
  4. To support local and international TVET programmes to enhance the quality of teachers and graduates.
  5. To promote the Digital Innovation Centre in becoming a reference point towards industry 4.0.

Considering the disparity of technology infrastructures in the region, how far can the acceleration of digitalization ensure expansive access to TVET while reducing the digital divide?

- The Digital divide exists for not just students but also teachers and in TVET as well as for workers and companies.
- It also needs to have the support from the telecom sector. Citizen rights for data access
- New Development initiatives should focus more on improving learning and creation of new systems, content, platforms and capacity building and less on buildings themselves.
- Make all the content and systems mobile friendly as that is the main medium. Example of Data from Labtech Academy.
- Create a Community of Practice for teachers and maybe students to support each other to develop

www. Labtech.org

www. Labtech-Academy.com

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Contact us for further information

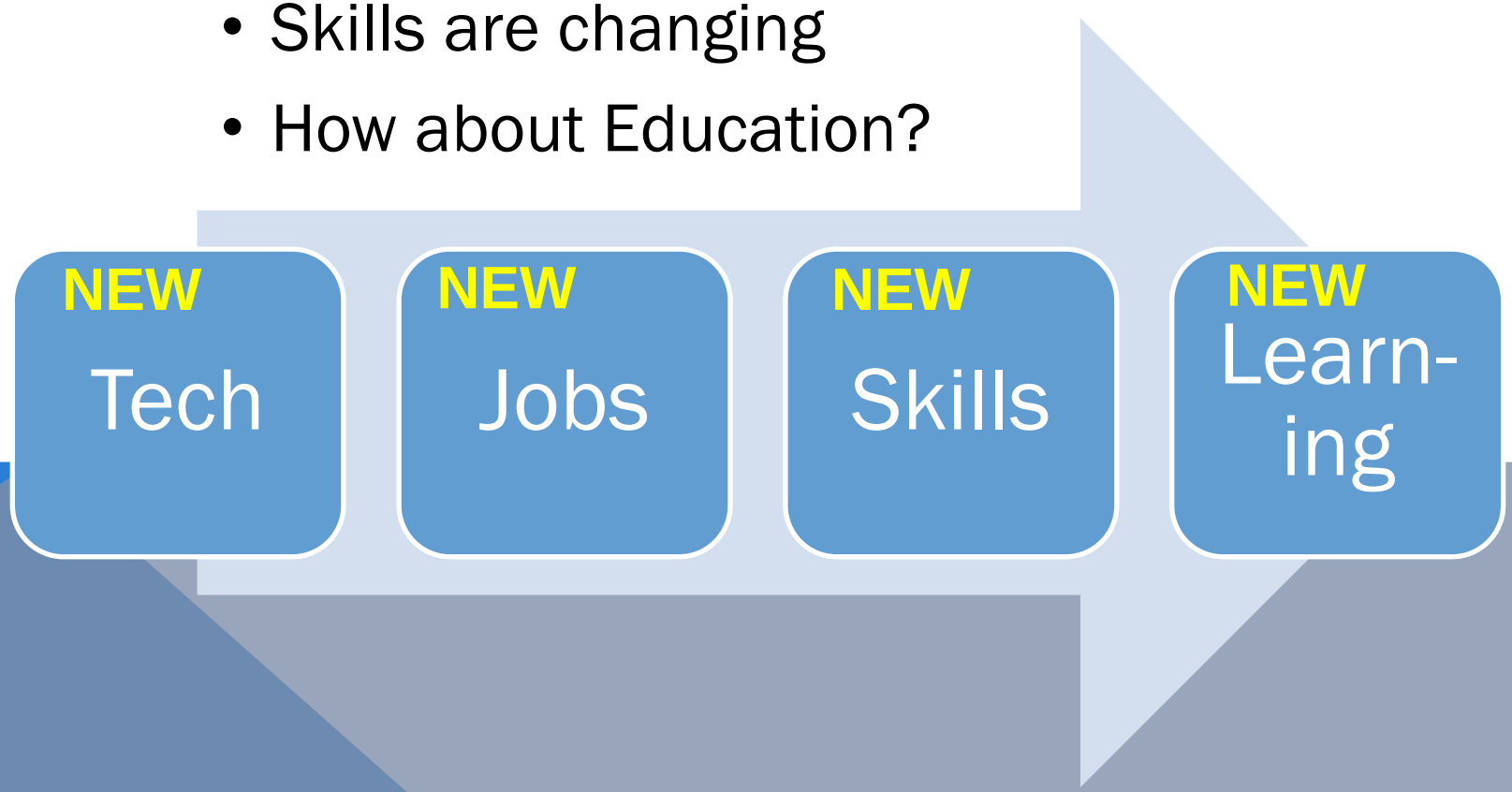
Dr. Steven McKee, President and Founder of
Labtech International Ltd. -- Email: steve@labtech.org

Additional Slides and information on Virtual TVET for Blended Learning

Examples of Interactive Learning Content and Delivery Platforms and performance indicators

The Future is changing - We must too

- Technologies are changing
- Jobs are changing
- Skills are changing
- How about Education?



COMPOUNDING ACCELERATING CHANGE

Covid Impacts

IR 4.0 Impacts

Societal and work change

DIGITAL

Change

Accelerated Change

Making TVET Education more Effective and less costly

Most Educational Projects seem to be designed to build monuments; **It is time to Put Learning First** – It is the prime goal, invest in teachers and content.

- **No More Buildings:** Schools can have double capacity, New projects do not need to spend budgets on more building, just make them more effective
- **Less Equipment:** Less equipment is needed, should complement the digital content and be planned together.
- **More Learning: Invest in Digital content -** Students will have a better grasp of the principles, Students can learn quicker, Pedagogy-Andragogy-Heutagogy. Better teacher support and training.

BLENDED VIRTUAL LEARNING: RE-THINKING TVET

VIRTUAL TVET: Creating the Right Balance between Theory and Practical Hands-on Learning

Higher Order Thinking Skills (HOTS)

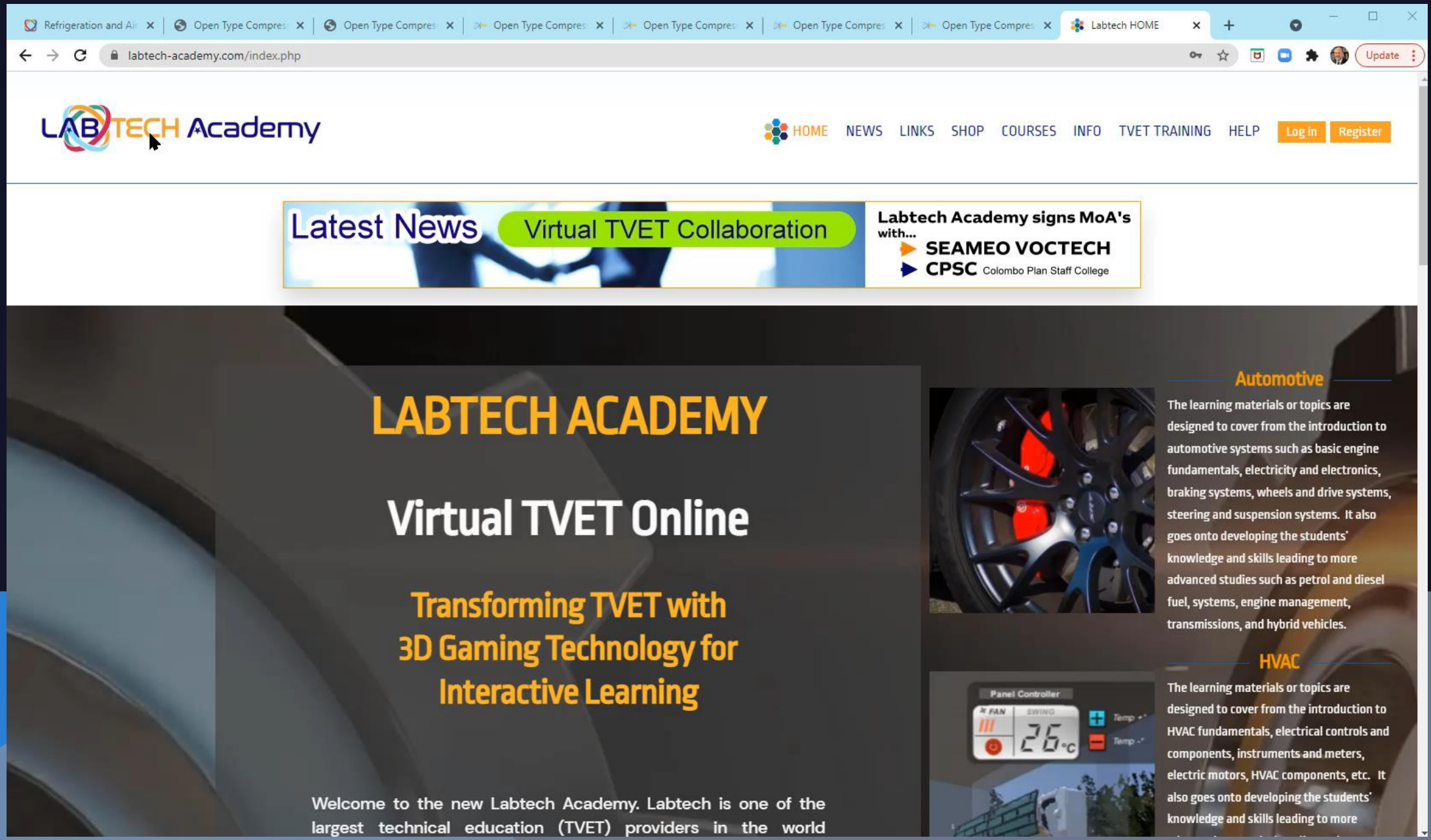
Psychomotor	Affective	Cognitive
Practical	←	Theory

EXAMPLE OF SMART CLASS – TEACHER LED & BLENDED LEARNING

What is Digital or Virtual TVET?

- Using Realistic 3D advanced Gaming Technology for Teaching and learning
- Infusing new technologies for the benefit of learning (Web AR, VR, 360, scanning, real-time translation, AI, mobile tech, etc.)
- Interactive 3D animations and simulations
- Visualization of technical processes and applications
- Delivered with standard 2D PCs, Tablets, VR, AR
- Blended (braided) Learning with Practical hands-on
- Content delivered through an TVET LMS system that can provide student performance info to the schools and educational managers.
- Data driven learning and AI – Can aid the student in formative learning and eventually adaptive and differentiated learning. Game platform tools
- Enabling Learning off campus and on campus AWAT

INTERACTIVE REALISTIC ENGAGING AND EFFECTIVE LEARNING



Turn Average students into “A” Students

LABTECH ACADEMY – GRADE AVERAGES as at July 2021

Overall Grade Averages Pre-Test = 50.2% and Post-Test = 93.5%

HVAC (4,853 Users)	Quiz: Squirrel Cage Motor 1 Phase Pre-Test (Real)	Quiz: Squirrel Cage Motor 1 Phase Post-Test (Real)	Quiz: Cold Room Refrigeration Pre-Test (Real)	Quiz: Cold Room Refrigeration Post-Test (Real)	Quiz: Accumulator Pre-Test (Real)	Quiz: Accumulator Post-Test (Real)
Averages	5.07	9.86	4.54	9.61	4.22	9.38

Basic Electrical (6,954 Users)	Quiz: Squirrel Cage Induction Motors, 3 Phase Pre-Test (Real)	Quiz: Squirrel Cage Induction Motors, 3 Phase Post-Test (Real)	Quiz: Basic Low Voltage Electricity Pre-Test (Real)	Quiz: Basic Low Voltage Electricity Post-Test (Real)	Quiz: DC Motors Pre-Test (Real)	Quiz: DC Motors Post-Test (Real)
Averages	4.86	9.57	6.45	9.22	4.11	9.08

Automotive (6,258 Users)	Quiz: Hybrid Fundamentals Pre-Test (Real)	Quiz: Hybrid Fundamentals Post-Test (Real)	Quiz: Hybrid Transaxle Pre-Test (Real)	Quiz: Hybrid Transaxle Post-Test (Real)	Quiz: Hydraulic Power Steering Pre-Test (Real)	Quiz: Hydraulic Power Steering Post-Test (Real)
Averages	4.99	8.96	5.13	9.12	5.82	9.18

BENEFITS and Impact OF VIRTUAL TVET

- **Maximum Impact through Digital learning**
  - $1 investment in Digital learning gives the same impact on learning as $10 traditional building approach.
  - It is Quick and scalable, can uplift training across classes, schools and the country.
  - Can provide an update to older schools
- **Improved Student Comprehension**
  - Students learn from engaging and detailed content which improves their understanding and retention
  - Better comprehension of fundamentals improves skills training and reduces time to learn in the lab.

BENEFITS and Impact OF VIRTUAL TVET

- **Blended learning Lower Costs by 50 to 75%**
  - Redesigned labs for digital learning
  - Less equipment, different equipment
  - Digital upgrade is equivalent to a physical lab upgrade
- **Better Teacher Support**
  - Reduces Workshop or Lab time for students
  - Frees up teacher's time to mentor students
  - Enables teachers to train more students
  - Increased capacity of labs and schools

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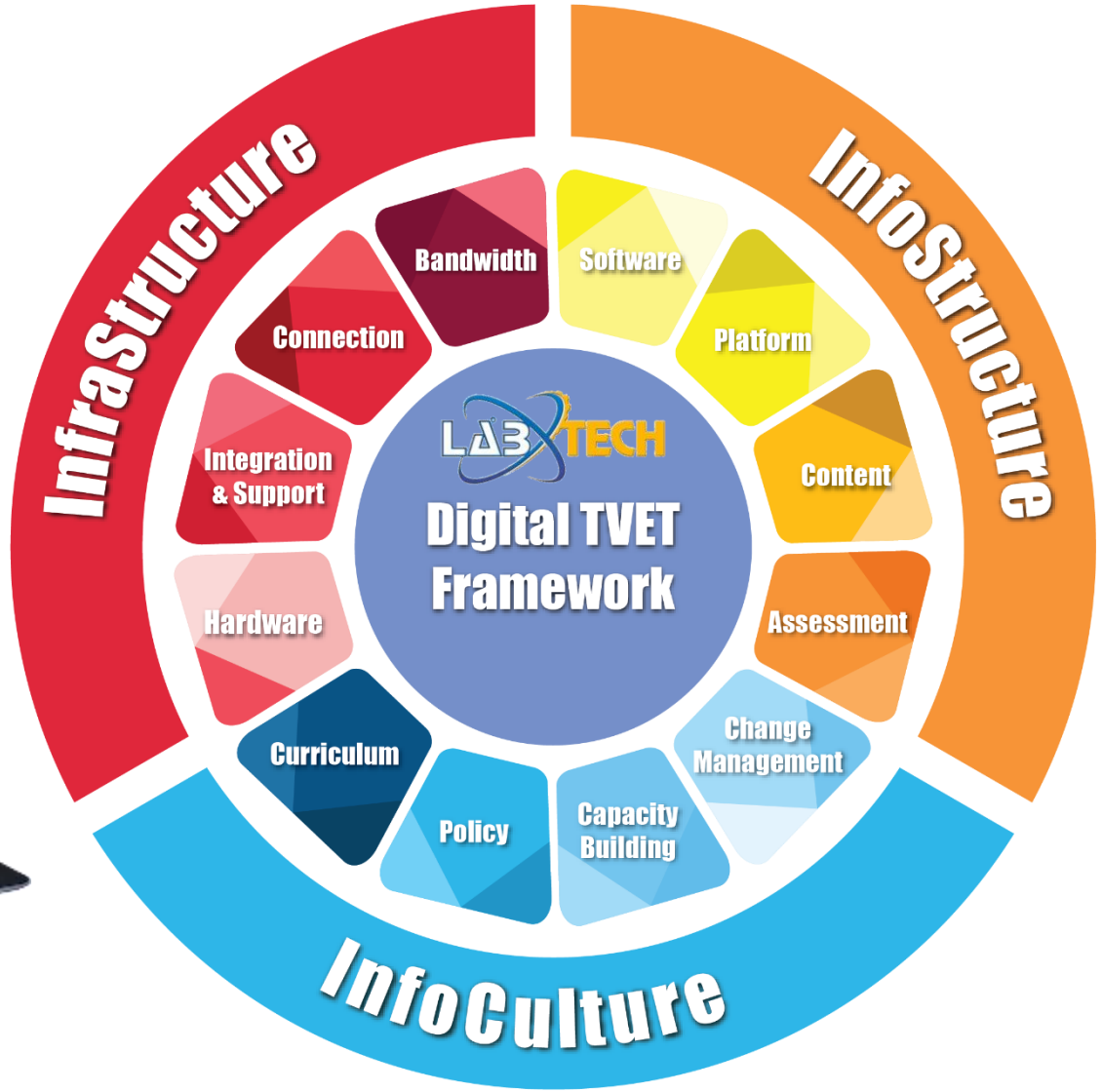
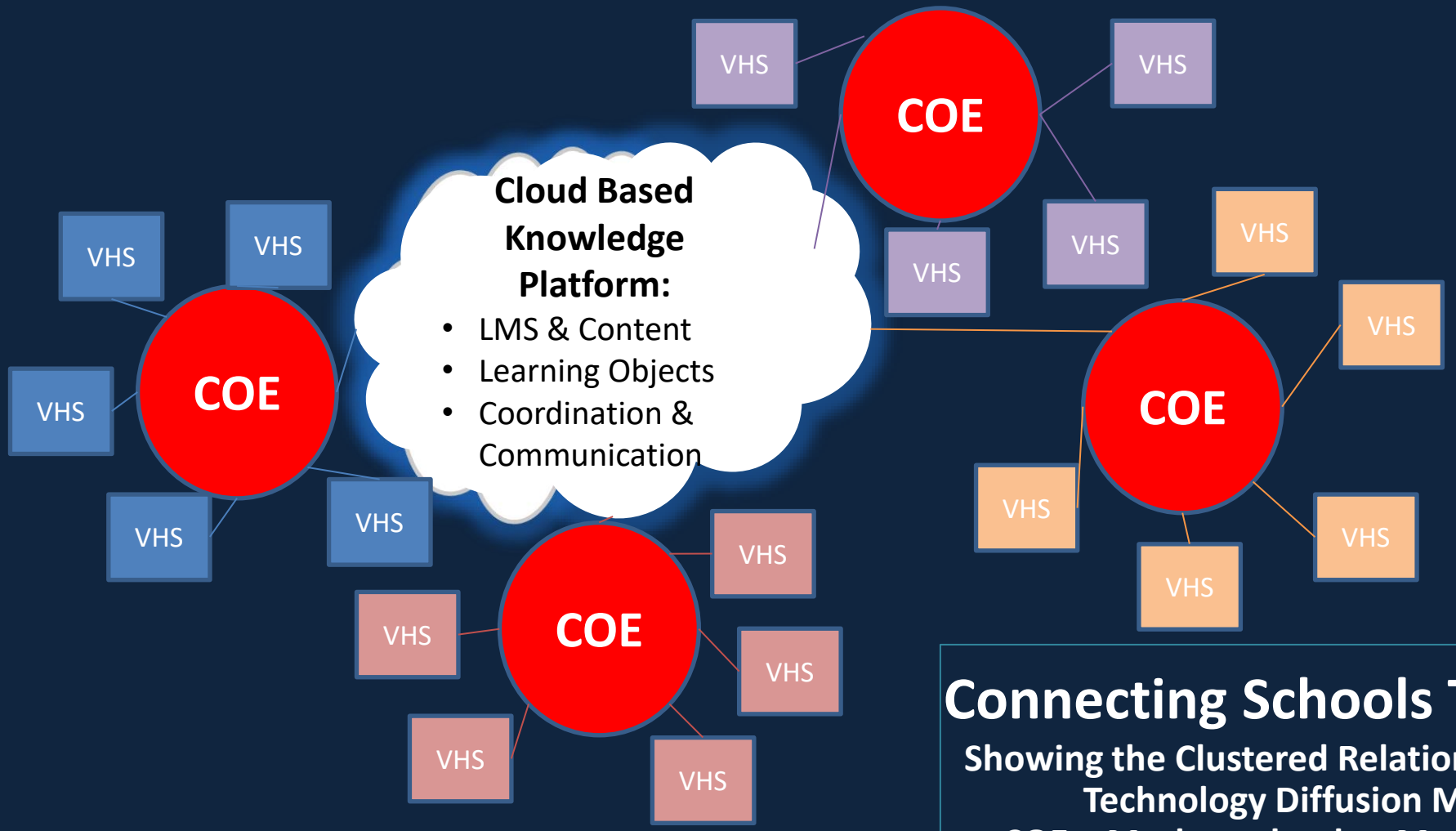


Cluster School Concept using Digital Technology



Connecting Schools Together

Showing the Clustered Relationship With a Technology Diffusion Model
COE – Mother school or Model School
VHS = Vocational High School or Satellite School

21ST CENTURY TVET – NEW LEARNING ARCHITECTURE

NEW ARCHITECTURE

Virtual Reality
For large systems or dangerous areas

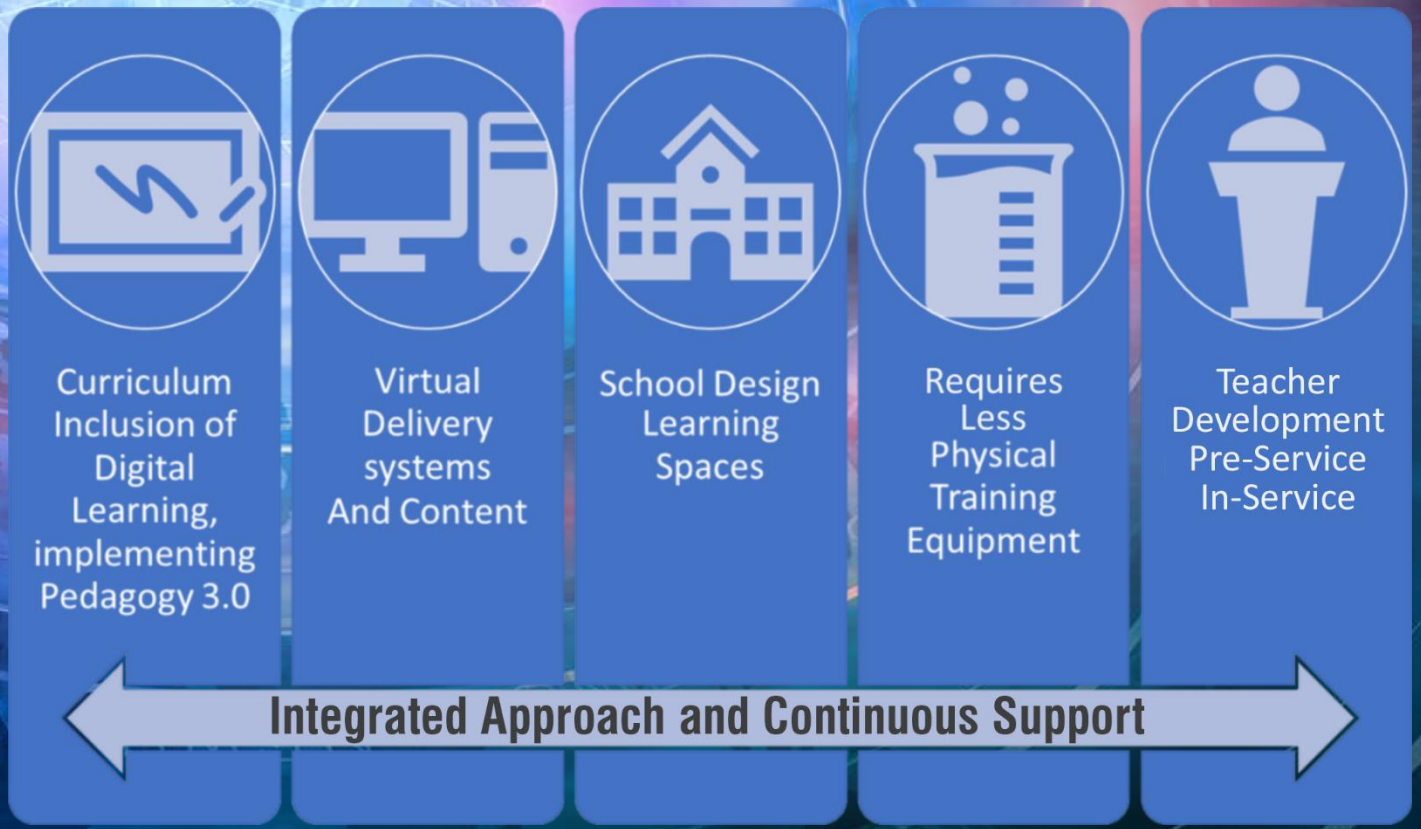
Augmented Reality
Paired with equipment

Mixed Reality Environment

Pre Lab Learning 2D / 3D
With laptops, Tablets & smart phones

Practical Hands-on Lab for Skills training

ENHANCED LEARNING POTENTIAL



FLEXIBLE IMPLEMENTATION OPTIONS

Teacher Led

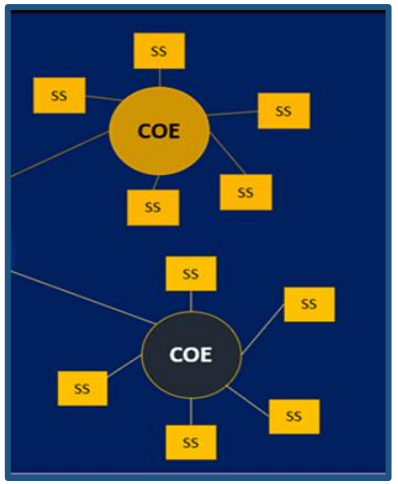
1 to Many
Class Group
Learning

Mobile Class

Mobile Trolley
or Case
1 to 1
Student
Learning

School Wide

Local Network
1 to 1
& Teacher Led
Learning



Cluster School

Multi Campus
1 to 1
& Teacher Led
Learning

CLOUD Based

Link to CTE
LMS & Sync
1 to 1
& Teacher Led
Learning

OUR GOALS SHOULD BE: Enhanced Student Learning Potentials

IR – 4.0 applied to Learning

New Generation of Interactive Digital Learning

- Self Paced – Differentiated & Adaptive materials and courses
- Enhanced & Quicker & Deeper Learning
- Recognition of Prior Learning
- Flexible (Non-Linear) Learning pathways
- Strengthens Fundamental Concepts
- Skills Cluster Approach – Cross Training
- Formative Assessment tools for Competency as part of the learning process
- Learning on Demand: anywhere and anytime
- Learning process more similar to work
- Moving beyond time-based education to performance or competency based.

For Use by Whom, When

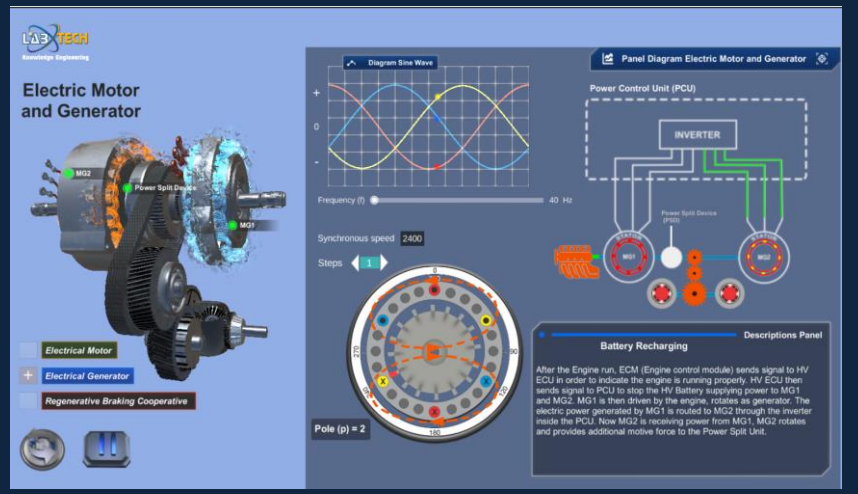
- For Institutions to use for their students and bridging apprenticeships with Industry
- For Adults for Life-Long Learning
- For Teacher upgrading on new technologies
- For Industry – For upgrading Staff –
- Up-Skilling and Re-Skilling for those out of work

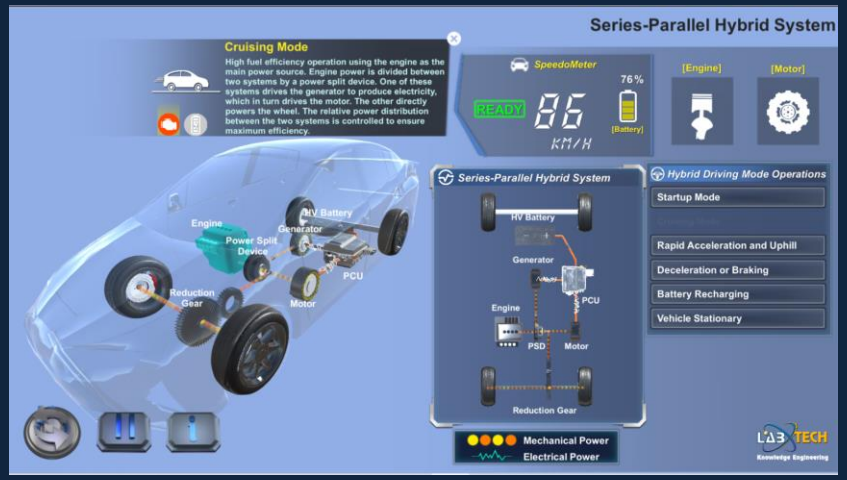
Virtual Reality - VR

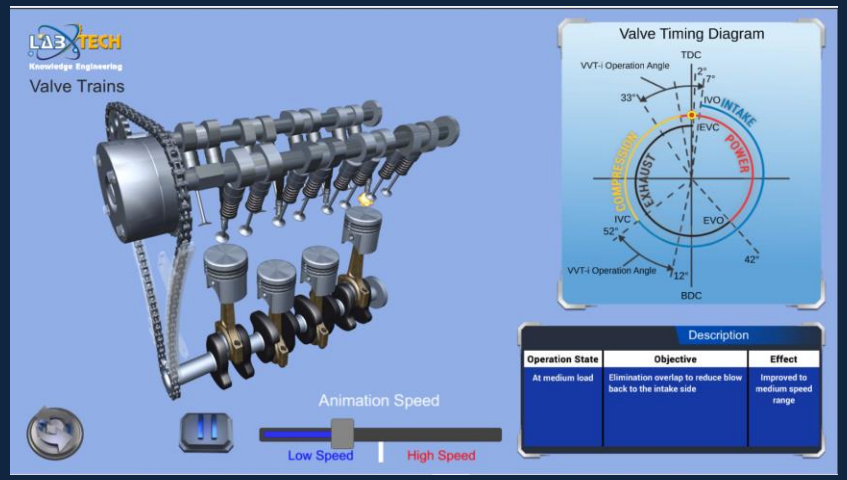
PLATFORM - TVET LEARNING MANAGEMENT SYSTEM (LMS)

- Fully loaded TVET LMS Platform designed for TVET learning
- Easy navigation through topics and courses
- KPI to monitor student's performance
- Non-linear learning so students can be sequenced in multiple ways
- **Can be mapped to existing curriculums**
- Designed for learning anywhere and anytime
- Teaching through visualization of complex topics
- **Interactive 3D gaming technology with many simulations**
- Photo realistic images and simulations
- **Innovative formative and summative assessments**
- Grade reporting and certificates of completion
- Extensive information and analytics built-in
- **Runs on multiple devices (smartphones, tablets, laptops and desktops)**
- **LTI compliant so can be incorporated into existing LMS platforms**

MOBILE BLENDED LEARNING FUNDAMENTALS LAB







BLENDED VIRTUAL LEARNING: RE-THINKING TVET

Learning through Applied Technology

FINISH with Employable Skill

Psychomotor

Practical

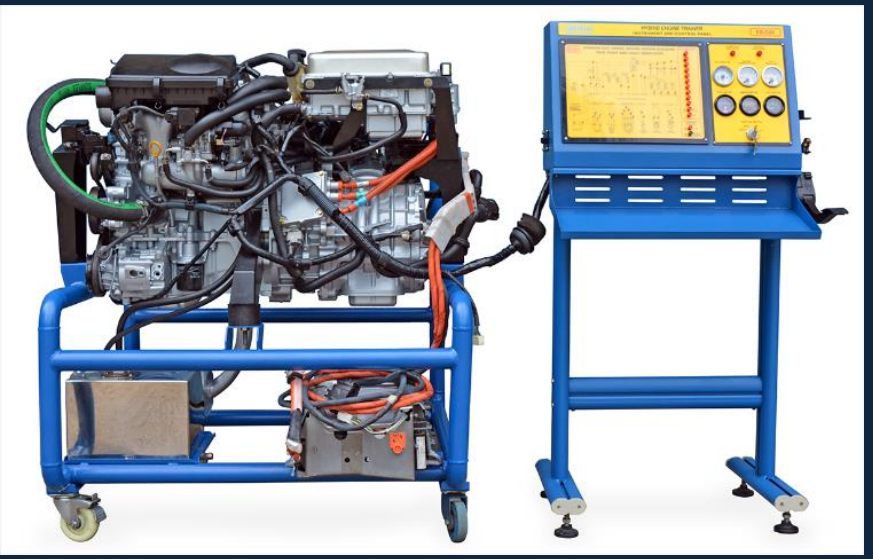
Higher Order Thinking Skills (HOTS)

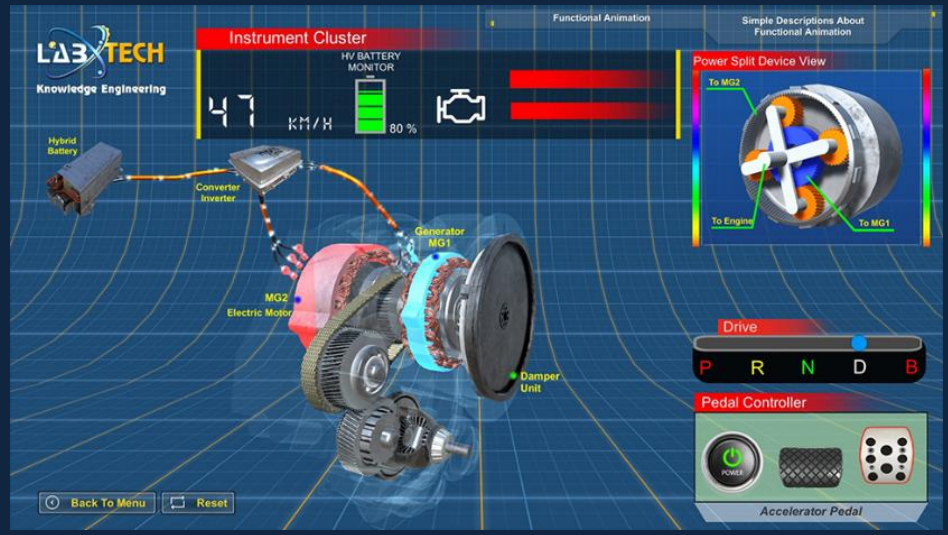
Affective

Cognitive

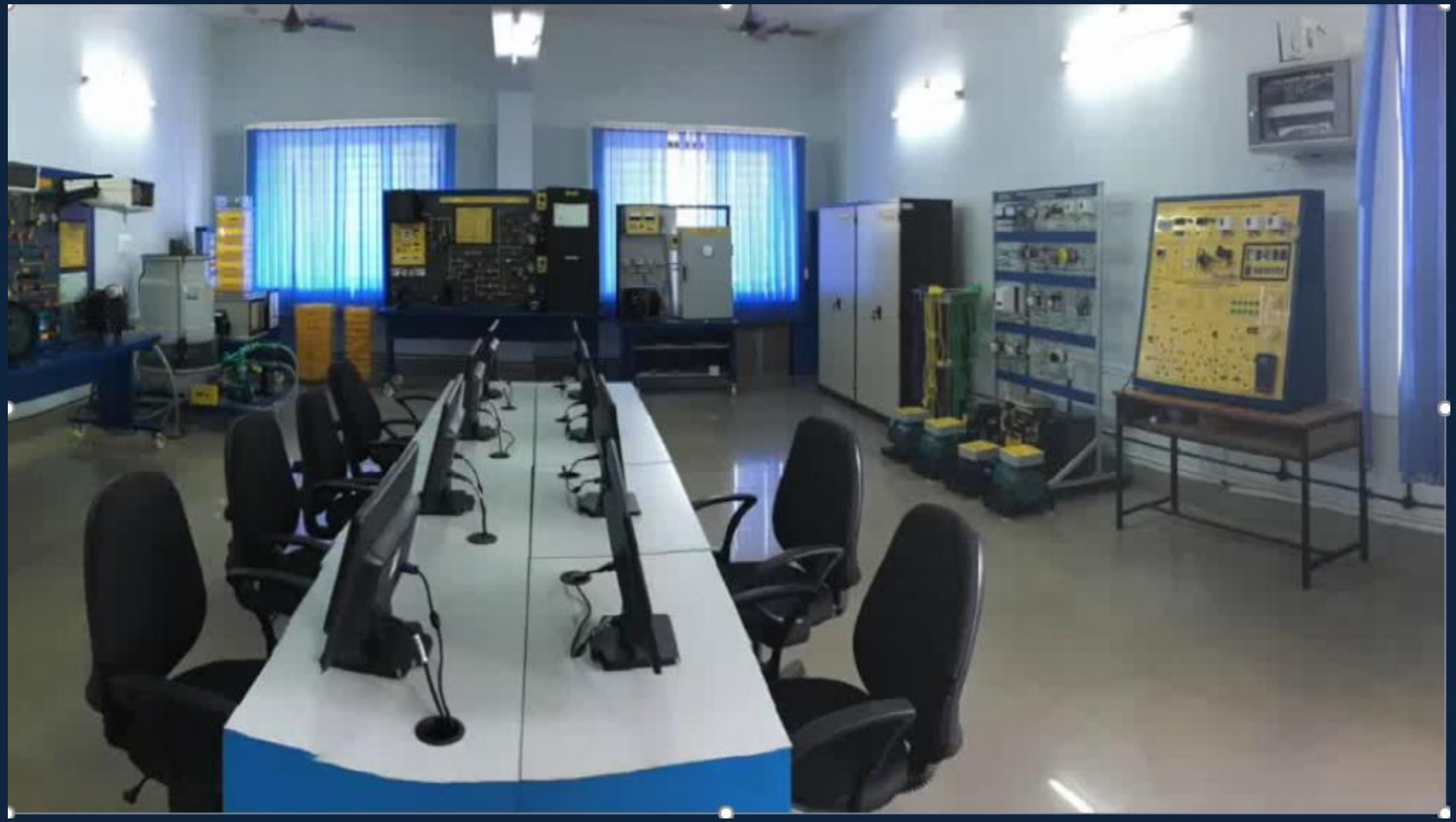
Theory

START with Zero knowledge



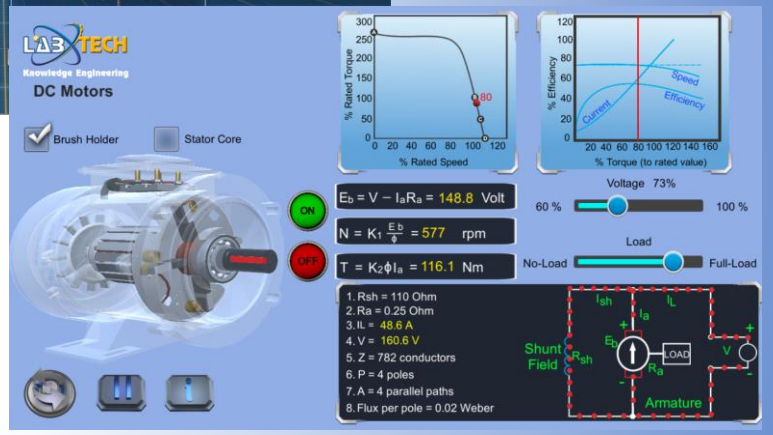


HVAC LABORATORY Blended Learning Lab in India



Combined Learning – Physical, AR, VR, 2D/3D – Learning program for Toyota Prius - Hybrid Vehicle technology

LABTECH ACADEMY – ONLINE VIRTUAL TVET



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