

## WHY e-LEARNING in TECHNICAL EDUCATION & TRAINING

**e-Learning** is considered the successor of the over 140 year old “distance education” and supposed to occur in different forms and various levels. A general consensus amongst the practitioners of education is that *e-learning* is ‘the use of processes and technologies to create, distribute, manage, and enable learning via an electronic network.

*E-learning* thus involves a complex interaction of teaching strategies, instructional design and computer technologies with the ultimate goal of delivering high quality ‘learning products.’ Universities around the world have embraced or fast embracing this learning concept owing to potential benefits such as “just in time” training, uninterrupted access to learning material with both synchronous (real time) and asynchronous (archived) delivery modes to a much wider and larger number of audiences simultaneously. *E-learning*, in this way has become a cornerstone profit generator for the academia mainly from an information delivery approach.

While *E-learning* is carving a niche in mainstream education, it is still finding its footholds in engineering education. The reason for this slow progress is the lack of certain frameworks that are able to deliver true dynamic ‘learning products’. Almost all the deliverable products being generated in the market masquerade as high quality learning aids which can be considered as mere static information delivery products. **For example, if one can consider a set of fancy PowerPoint slides as facilitators of learning, a closer inspection reveals the apparent lack of theoretical and practical depth or distinction in one line dot points. Additionally, engineering education has to deal with multiple levels of intelligence needing intensive and one-on-one interaction so that the lecturer might stoop low enough to raise the collective knowledge of a given class of students. Consequently, e-learning in engineering in many aspects can be devoid of any inherent value if the instructional material is not adequately designed to facilitate learning at all levels.**

Developing *e-learning* structures for engineering education thus poses unique challenges as compared with other fields.

### Online Learning Systems

With progressive increase in the capabilities of open source and commercial Learning Management System (LMS) software, unit and course management, content upload and management features, communication tools (i.e. forums, chat rooms, etc.) as well as assessment tools (i.e. quizzes, polls, assignment submission) incorporated into the OLT system.

## E-learning in Engineering Colleges and Polytechnics

Teaching highly technical subjects using the common *e-learning* tools is a challenging task. The general rules that may apply to the arts and social sciences fail miserably as learning in engineering occurs in discrete quanta and the failure of a student to grasp certain basic fundamentals will not foster further learning in a given subject area or topic. This is found to be very common in the first two years of undergraduate studies where we have noticed a high level of attrition from students who were instructed to refer to “certain lecture material” on some of the main problems with directing undergraduate engineering students to any potential *e-learning* media are:

1. **Lack of Preparedness:** – A general attribute of students is to get over and done with a set of tasks by reading what is ‘required’ to get the job done. Everything else is considered a mere waste of time;
2. **Attrition & Impatience:** – what begins as an enthralling learning experience often dwindles midway due to apparent lack of further interest or the students lose their way as they progress from basic to advanced concepts. A case in point is students trying to grasp difficult topics for the first time, rendering the experience akin to TV channel hopping and surfing. The mouse could be clicked on the various hyperlinks with great impatience turning the student from a concentrated reader to an abstract browser of the content;
3. **Limited Computer Skills:** – some students face steeper learning curves than others in using computers and associated learning software which may impede their progress or cause them to end up doing a rush job in trying to keep up with their fellow students/class;
4. **Information Retrieval & Assessment:**– Perhaps the major catastrophe as a large percentage of students do not read and understand the instructions ‘carefully’ and are consequently unable to interpret the problem at hand correctly. Cultural and linguistic disparities further compound this problem.

## Support Structures for E-learning in Engineering Education:

In order to overcome the aforementioned problems, academics must place a greater emphasis on better teaching and learning strategies and design courses that enable the delivery of a true learning product rather than serve as a mere repository for reading material somewhere in cyberspace. In the drive to use certain processes and computer technology to develop and deliver a learning product, it is important to accurately identify the “processes” that will help


establish effective learning media. *E-learning* must be a self-paced exercise which should result in greater retention of the content over longer periods of time. However, even in the learner-centered approach that *e-learning* fosters, lack of learner skills in terms of computer knowledge, self discipline, patience and time management can initiate adverse effects on the potentially slow learner. Poor course design can result in:

- a) Incomplete assimilation of course content resulting in either little or no learning occurring.
- b) Misconceptions of the theoretical and practical implications of the course content.
- c) Negative perception of the value of technology-based learning leading to attrition and
- d) Gross wastage of resources that universities invest for such learning initiatives

If we are to churn out more competent and smarter engineering graduates via *e-learning* strategies, there are some immediate goals that must be incorporated into the scenario:

1. The learning media must not serve as a mere depository for learning material;
2. The learning content must be designed so that it captures the interest of the learner in such a way that it generates a desire for further learning;
3. While being more informative, the content must be more interactive and prompt the learners intermittently to reflect on what they have read or seen on their screens;
4. Unit content must be made more visually captivating and for this, unit coordinators must break the monotony of one color or graphic style and bring in more 'flash' oriented presentations which will convey the concepts more lucidly;
5. Academics themselves must first discover the methods of programmed learning structures within the *e-learning* systems. For example, if a student is good enough to advance in some concepts at a greater pace, there should be mechanisms within the *e-learning* repository that are able to discover such a trait and direct the learner to the advanced topics much earlier.

**All these efforts are simultaneously leading to the creation of a knowledge base which will be used to incorporate more learner adaptability in *e-learning*.**

We at  **Pune, India opine that the ultimate goal of any *e-learning* system is to possess an ability to adapt the learning environment itself to the student's acumen and capabilities. The *e-Learning* system should enhance the capabilities of the teacher to teach in a logical sequence so that the students grasp the complex concepts immediately and adapting itself to the needs of the student.**

Academics will have a major role to play in developing such *e-Learning* systems by beginning to develop a knowledge base of intelligent learning based on their experience and collective perspectives. **It must be noted that e-Learning is a teaching aid and it cannot substitute/replace teachers.**

### **Why should Educational Institutes Buy Computer Aided Instructions(CAI) Packages?**

It is one time investment with most effective use of computer resources with minimum cost. Standardization & Uniformity in teaching can be maintained with less experienced faculties with the Institutions. Core conceptual understanding of Engineering Subjects is a basic need to solve the numerical problems based on complex formulae, & helps to improve the academic performance of the Institutes, enabling the effective use of computers in Educational Institutes.

### **Benefit to Colleges/Teachers.-Multimedia Based Learning Resources with Computer Aided Instructions:**

Colleges/Teachers can maintain Uniformity in teaching. Single Faculty members can teach different subjects can make presentations more interesting while conducting lectures enabling ready to use teaching material **Anytime -- Anywhere -- for Anyone.**

### **Benefit to Students.**

Any Subject becomes more interesting with CAI packages consisting of lot of Visuals in the form of animations Graphics for Easy understanding of the core concepts of the subject with the help of point wise text and real life photographs. Better visualization of the working principles with the help of 2D and 3D animations. Students can learn on their own if missed the classes at the eLibrary any time. It helps to develop self learning skills in the students.



**eLearning  
for  
Sustainable  
Development  
for  
Strong  
Nations**

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**IIT / NIT**

- Indian Institute of Technology, Mumbai
- Indian Institute of Technology, Kanpur
- Malviya National Institute of Technology, Jaipur
- S. V. National Institute of Technology, Surat
- National Institute of Technology, Kurukshetra
- National Institute of Technology, Srinagar
- Vishveshvaraya National Institute of Technology, Nagpur

**Institutes / Polytechnic Colleges**

- Govt. Polytechnic, Ahmedabad
- Govt. Polytechnic, Dehradun
- Govt. Polytechnic, Hamirpur
- Govt. Polytechnic, Sunder Nagar
- Assam Engineering Institute, Guwahati
- Director, Technical Education & Industrial Training, Chandigarh
- Director Technical Education, Haryana, Chandigarh
- Director, SPIU, Meghalaya, Shillong
- TTTI, Bhopal
- NERIST, Nirjuli, Itanagar
- Arasan Ganesan Polytechnic, Chennai
- Govt. Kalaniketan, Jabalpur
- Govt. Polytechnic for Women, Kandaghat
- Govt. Polytechnic, Malvan ,
- Shri Bhagubhai Mafatlal Polytechnic, Mumbai
- PCMC Polytechnic, Nigadi
- ITI Aund

**Engineering Colleges**

- College of Military Engineering, Pune
- Sardar Patel college of Engineering, Mumbai
- Bengal Engineering College, Kolkata
- Govt. College of Engineering, Pune
- Govt. College of Engineering, Jabalpur
- Govt. College of Engineering, Karad
- Govt. College of Engineering, Raipur
- Govt. College of Engineering, Goa
- Govt. College of Engineering, Modasa
- L.D. Engineering College, Ahmedabad
- Govt. Engineering College, Rewa
- S. V. University College of Engineering, Tirupati
- L.B.S. College of Engineering, Kasaragod, Kerala
- Dr. S. S. Gandhi College of Eng. & Tech., Surat
- Kalyani Govt. Engg. College, West Bengal

- Bangalore Institute of Technology, Bangalore
- Building Technology Centre, Anna University, Chennai
- Gogte Institute of Technology, Belgaum
- Maulana Azad College of Technology, Bhopal
- Dr. Ambedkar Institute of Technology, Bangalore
- Madhav Institute of Technology & Science, Gwalior
- Manipal Institute of Technology, Manipal
- M. S. University of Baroda, Baroda
- Bundelkhand Institute of Engineering & Technology, Jhansi
- Coimbatore Institute of Technology, Coimbatore
- Kakatiya Institute of Technology, Warangal
- Samrat Ashok Technological Institute, Vidisha
- Rajarambapu Institute of Technology, Islampur
- Sinhgad College of Engineering, Pune
- Maharashtra Institute of Technology, Pune
- Kumarguru College of Technology, Coimbatore
- Mepco Schlenk College of Engineering, Virudhnagar
- P. D. A. College of Engineering, Gulbarga
- Institute of Science Technology & Advance Research, Vidyanagar
- Andhra University College of Engineering, Visakhapatnam
- Mohammad Sathak College of Engineering, Kilakarai
- Tatyasaheb Kore Institute of Engineering & Technology, Warnanagar
- Algappa College of Engineering & Technology, Karaikudi
- Padmashree Vasantdada Patil Institute of Technology, Budhgaon
- Mufakkam Jah College of Engineering, Hyderabad
- Dayanand Sagar College of Engineering, Bangalore
- Pravaranagar College of Engineering, Pravaranagar
- Maharashtra College of Engineering, Nilanga
- Institute of Road & Transport Technology, Erode
- Assam Engineering College, Guwahati
- R & D Engineers (DRDO), Pune
- USIC Kurukshetra, University
- Vasavi Power Services Pvt Ltd, Hyderabad
- INS Shivaji Lonavla

**Abroad**

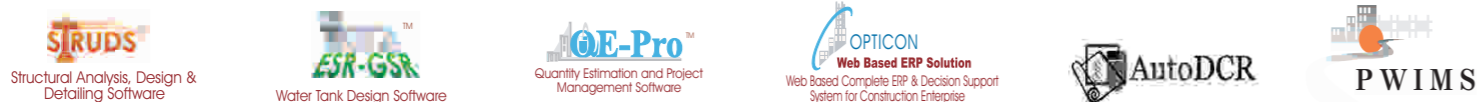
- NYERI Technical Training Institute, Nairobi, Kenya
- Mombasa Technical Training Institute, Mombasa, Kenya
- International Islamic University Kuala Lumpur, Malaysia

**Corporates**

- Hindustan Petroleum
- Indian Railways
- L & T



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We also Organize Training Program for Development of eLearning instructional Material & Develop Customized eLearning Modules for Organizations / Institution.

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[sepl@softtech-engr.com](mailto:sepl@softtech-engr.com)

**System Requirement**

IBM-PC Compatible Min P-III with Window-OS,  
128 MB RAM / Multimedia Kit

**Authorised-Rep./Dealer/Book Sellers**

**AN ISO 9001: 2008 CERTIFIED COMPANY**

# eLearning for Success and Competitive Advantages



**Skills Acquisition and Workforce Development are Vital for a Nation to Compete and to Grow.**



## DIGITAL LIBRARY FOR HUMAN CAPABILITIES / SKILLS DEVELOPMENT

**CREATE - MANAGE - DEPLOY - DELIVERY OF KNOWLEDGE**

**eLearning for Educational Institutes & Corporates**

**Computer Aided Teaching & Learning for Technical ( Engg./Diploma/ITI) Education / Schools, Soft Skills Development, Allied Medical & Vocational Studies for Subjects of:**

- Electronics & Telecom Engg.
- Instrumentation/Bio-Medical Engg.
- Mechanical Engg.
- Electrical Engg.
- Computers & IT Engg.
- Civil Engg.
- Business Management Studies & Quality Management Systems

- Basics of Using Computer and Networking
- Maintenance of PC Hardwares
- Nanotechnology , GIS
- RFID - System, NDT
- Food Technology.
- Home Science & Vocational Courses
- Agricultural Engg.



**ENHANCING PERFORMANCE SKILLS OF TEACHERS - STUDENTS - TRAINERS - WORK FORCE.**

## BENEFITS OF TEACHING / LEARNING AIDS

- Helping students to understand core concept with powerful visual Aids with Self paced / Self study / Self controlled Effective method of learning.
- eLearning helps as Teaching Aids to Teachers as a **QUICK REFERENCE GUIDE**.
- Software Tools for Practice in College Library for Improvement of College Results .
- Self help Self learning tool to Students, who have missed Lecture & needs additional practices at home.
- Training Aids for Coaching Institutes to Improves Performance.

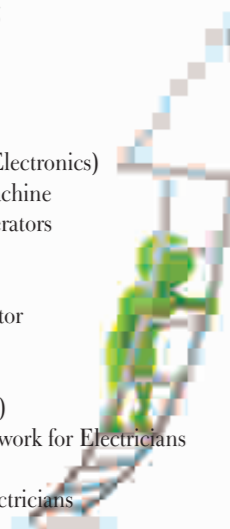


IT and workplace skills for 21st. century jobs are desperately needed in developing countries. A trained workplace can help nations and communities improve economic growth, reduce poverty and achieve sustainable development. Developing countries lack the appropriate human and economic resources to build competent and cost-efficient skills development programs.

This situation is leading to “under-prepared” degree holders, As it's not possible to send thousands of expert instructors to each Institutes of developing countries. eLearning is the only viable alternative that can reach the masses. eLearning has proven to be the most cost effective method of disseminating high-end “expert” level instruction from “one to many”

### SUBJECTS FOR ITI / VOCATIONAL TRADES

Advanced Electronics (Microprocessor)	Electrical Machines for Industrial Electricians	Metrology & Quality Control
Automobile Engineering Technicians(Basic Concepts)	Electrical Measuring Instrument	Milling Machine Mechanic (Basic Concepts)
Basic Analog Electronics	Estimation and Costing	Milling Machine Mechanic/Operator (Basic concepts)
Basic Digital Electronics	Fashion Technology	Mobile Repairing
Basic Electrical System	Fitter	Mobile Communication Technology (Basic Concepts)
Basic Electrical Circuits	Food Technology	NDT-Non Destructive Testing
Basic Electronics	Foundryman (Basic Concepts)	Operation & Maintenance of Equipments used in HT, LT,
Basic Power Generation, Transmission & Distribution.	Fundamentals of Computer	Substation & Cable Jointing
Basic Wiring and Winding	Grinder Mechanic (Basic Theory)	Packaging Technology
Beautician (Hair cutting)	Garment Design Techniques	Plumbing & Sanitary Inspector
Beautician (Skin Care)	Industrial Automation	Power Electronics
Carpenter	Information Technology & Electronics	Repair & Maintenance of Domestic Appliances
CNC Machines	System Maintenance	Repair & Maintenance of Electrical Machine & Power Supply
Communication System (Electronics)	Jigs & Fixtures (Basic Theory)	Repair & Maintenance of Electronics Test Equipments
Computer Embroidery Machine	Mechanic - Automobile (Basic Theory)	Sheet Metal Worker (Basic Concepts)
Computer Data Entry Operators	Mechanic (Domestic, Commercial Refrigeration & Air Conditioning Machine)	Soldering Technology
Cutting & Sewing	Mechanic Auto Electronics	Stenography(English)
Dairy Technology	Mechanic Automobile (Basic Theory)	Surveying- I
Desktop Publishing Operator	Mechanic Communication Equipment	Tools and Dies (Basic Concepts)
Diesel Engine Mechanic	Maintenance	Turning - Lathe Machine
Draughtsman (Civil)	Mechanic General Electronics	UPS/Voltage Stabilizer/Inverters and Industrial Drives
Draughtsman (Mechanical)	Mechanic Refrigeration & Air Conditioning (Basic Theory)	Welding (Basic Concepts)
Electrical Circuits and Network for Electricians and wireman	Mechanical Measurement Instruments	Winder Electricians
Electrical Drawing For Electricians		



## LIST OF SUBJECTS IN ENGINEERING - VOCATIONAL - TRAINING - HRD

### B.E. First Year Engineering

- Applied / Engineering Mechanics
- Applied Chemistry
- Applied Physics
- Applied / Material Science- I
- Applied / Material Science- II
- Basics of Using Computer / Information Technology
- Basics of Environmental Studies
- Communication Skills
- Computer Programming & Utilisation
- Engineering Graphics/Drawing
- Elements of Mechanical Engineering
- Elements of Electronics Engineering
- Elements of Electrical Engineering
- Elements of Civil Engineering
- Engineering Mathematics – I
- Engineering Mathematics – II
- Workshop Technology

### Information Technology / Computer Science Engineering

- Artificial intelligence & Expert System
- Basics of Using Computer/Information Technology
- Computer Fundamentals (Windows 98 / 2000 / XP; Internet basics, MS Office, (MS Word, Excel, Power point)
- Computer Graphics
- Computer Organisation
- Desktop Publishing (PageMaker & Corel Draw)
- Database (DBMS / RDBMS, MS Access, MY SQL, Oracle)
- Internet Technologies (Java, Core Java, Advanced Java)
- Microsoft .net (.net Essential, ASP .net, VB .Net, C#)
- Operating Systems (Unix & Linux)
- Programming (Programming Concepts, C, C++ , Visual Basic, Developer 2000)
- PC Hardware Maintenance & Troubleshooting
- Scripting Language (ASP, XML, WAP / WML)
- Web Designing (HTML, DHTML, Dreamweaver, Flash, Photoshop)

### HRD & TRAINING Soft Skill's Development For

- Organizations & Structures
- Principles of Management
- Human Resource Management
- Team Management
- Strategic Planning
- Time Management
- Leadership & Motivation
- Decision Making
- Operation Management
- Measurement & Accountability
- Management of Change
- Communication
- Ethics and Culture
- Enterpreniership
- Placements & Training
- Software Testing
- Software Project Management
- Project Management
- Project Performance Management
- Disaster Management (Fire, Safety, Health)

### E&TC/Industrial Electronics / Instrumentation Engineering

- Antenna Engineering & Waves Propagation
- Bio-Medical Electronics Engineering
- Communication Systems
- Computerized Process Control System
- Data Communication & Networking
- Digital Communication & Circuits
- Digital Image Processing
- Digital Signal Processing
- Digital Techniques & Applications
- Electronics Materials & Components
- Embedded Systems
- Electronics Measuring Instruments
- Electro Magnetic Field Theory
- Signals & Sensors
- Industrial Automation
- Linear Integrated Circuits
- Microprocessor 8085 Lab
- Mechatronics
- Microprocessor & Microcontroller
- Mobile Communication
- Microwave Engineering
- Optical Fibre Communication
- Power Electronics
- RFID System
- VLSI-Design Techniques

### Electrical Engineering

- Elements of Electrical Engineering
- Electrical Circuits & Network
- Electrical Machines
- Electrical Power System
- Energy Audit & Managements
- Energy Conservation System
- Energy Conversion Systems
- Electrical & Illumination Design
- Electrical Measurement & Instrumentation
- Electrical Engineering Material
- Electrical Engineering Drawing
- Industrial Electronics
- Industrial Automation
- Modern Control System
- NDT- Non Destructive Testing
- Power Plant Engineering
- Repair of Electrical Machines
- Renewable Energy Sources
- RFID System
- Switch Gear & Protection

### Mechanical / Automobile / Production Engineering

- Automobile Engineering
- CNC Machine
- CAM & Automation
- Engineering Drawing / Engg Drawing Graphics II
- Elements of Mechanical Engineering
- Energy Audit & Managements
- Energy Conversion Systems
- Engg. Mechanics
- Fluid Mechanics
- Manufacturing Processes
- Machine Design
- Mechatronics
- Mechanical Measurement
- Metrology & Quality Control
- Nano Technology
- NDT- Non Destructive Testing
- Power Plant Engineering
- Quality Management System
- Renewable Energy Sources
- Robotics & Automation
- RFID System
- Refrigeration & Air Conditioning
- Thermal Engineering
- Theory of Machines
- Thermodynamics
- Tool Engineering
- Unconventional Machining
- Workshop Technology
- Basics Pneumatics
- Basics Hydraulics

### Civil / Architecture / Agricultural Engineering

- Applied / Engineering Mechanics
- Aerial Surveying
- Building Construction
- Building Material
- Civil Engg Drawing
- Concrete Technology
- Construction Project Managements
- Design of Structure
- Earth Quake Engineering
- Estimation & Costing
- Engineering Drawing
- Elements of Civil Engineering
- Environmental Engineering
- Forestry
- Geographical Information System
- Hydraulics
- Irrigation Engineering
- Mechanics of Structure
- NDT- Non Destructive Testing
- Quantity Survey & Estimation
- RCC & Steel Design
- Remote Sensing
- RFID System
- Sanitary Engineering
- Soil Mechanics
- Surveying - I
- Surveying - II
- Theory of Structure
- Transportation Engineering
- Topographic Survey

