



The Effect of Theory-Practice Bridge on the Engineering Teaching *

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Introduction

- ☀ Today's engineers must continuously reconstruct their expertise and be able to apply their theoretical knowledge in actual work.
- ☀ The development of expertise is a long process, during which theoretical, practical and metacognitive elements of expert knowledge are integrated into a coherent whole.
- ☀ It is important to foster student's learning and integration of theoretical knowledge in practice during tertiary education. One tool for this is to pay more attention to practical knowledge in the theoretical part of the curriculum.



Teaching of Engineering

Teaching of engineering may be creativity and innovation by encouraging students to:

- ✿ brainstorm ideas
- ✿ develop novel solutions to open-ended problems
- ✿ examine a problem from numerous angles
- ✿ work collaboratively
- ✿ predict what will happen
- ✿ test and experiment
- ✿ Troubleshoot reflect on successes and failures
- ✿ communicate results



Education Standards Satisfied



Scientific Inquiry

All students should develop

- ✦ Abilities necessary to do scientific inquiry
- ✦ Understanding about scientific inquiry



Physical Science

All students should develop an understanding of

- ✦ Properties of objects and materials
- ✦ Properties and changes of properties in matter





Data Analysis and Probability Standards

- ✦ formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- ✦ develop and evaluate inferences and predictions that are based on data.



Design

- ✦ Students will develop an understanding of the attributes of design.
- ✦ Students will develop an understanding of engineering design.
- ✦ Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.



Any teaching method must include:

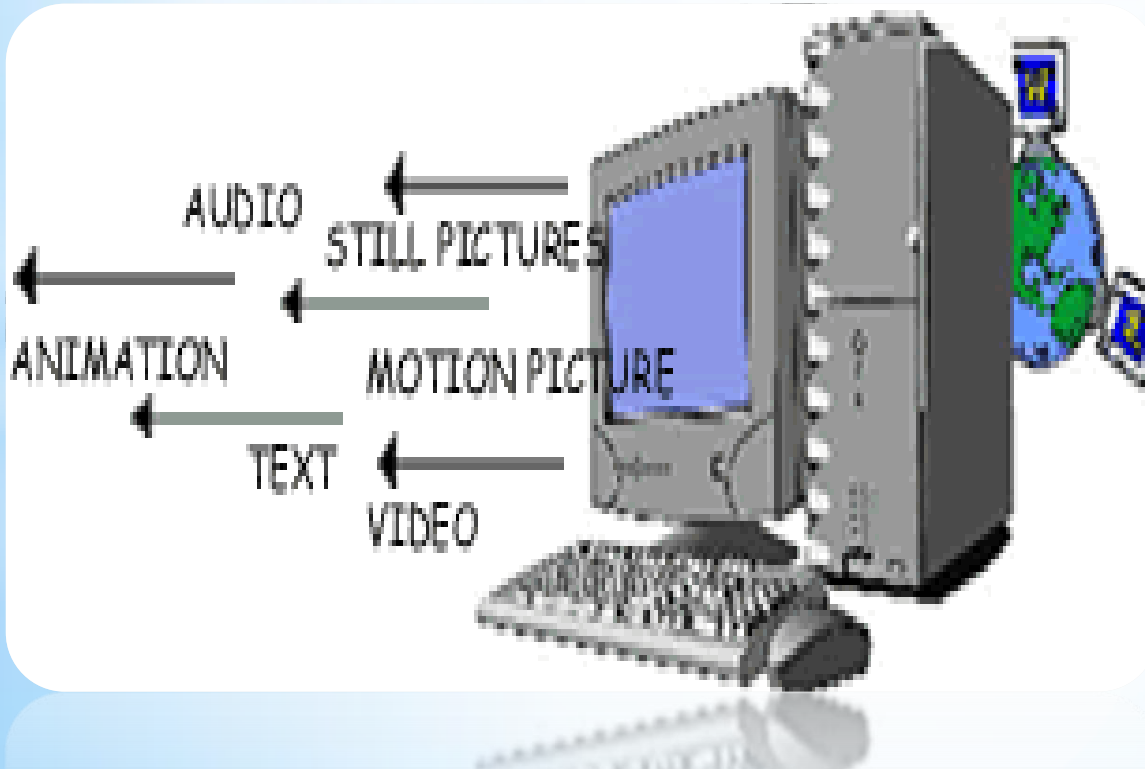
Text

Images

Audio

Video

Animation





Any Practical Side must include:

Animation & Movies

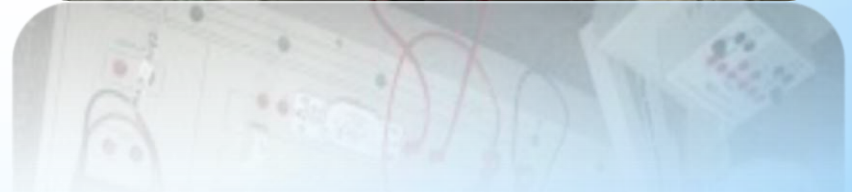
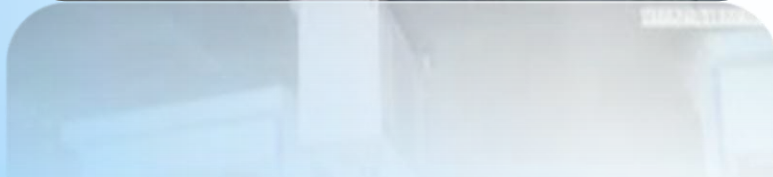
Laboratories

Computer Software's

One of the distinguishing elements of engineering education is the laboratory requirement.



Computing and communication technology has had a significant impact on the engineering education system. This technology has improved computer learning software's which improves the students learning experiments .

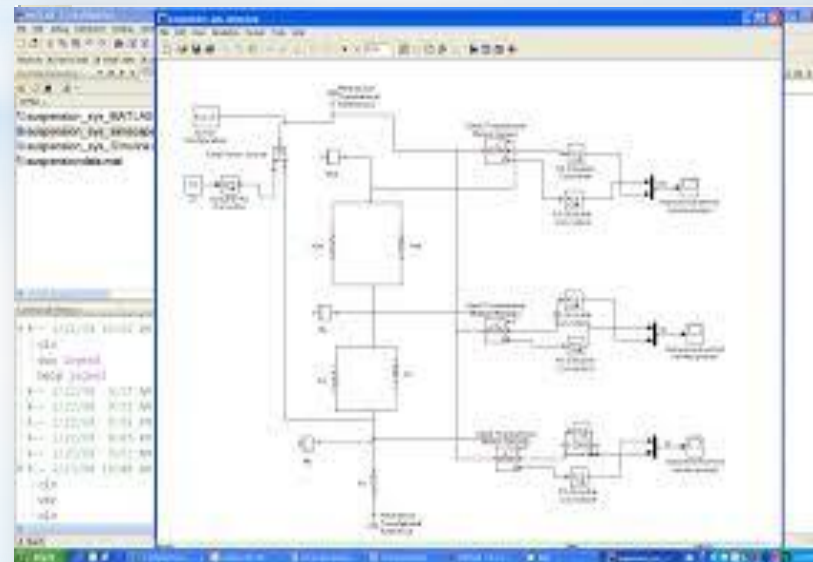


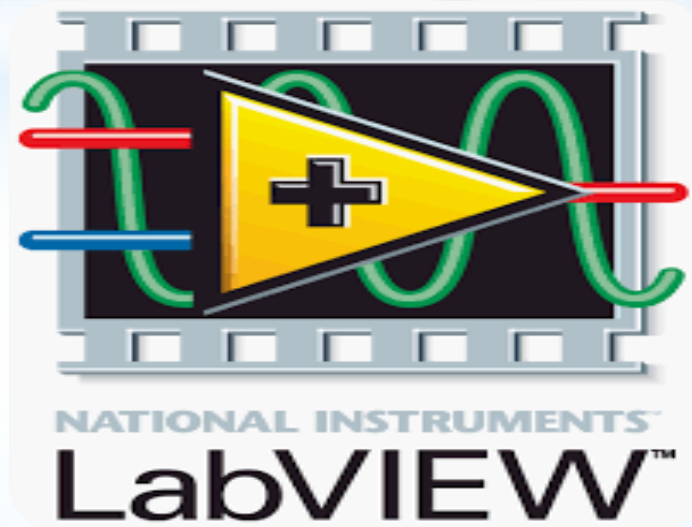
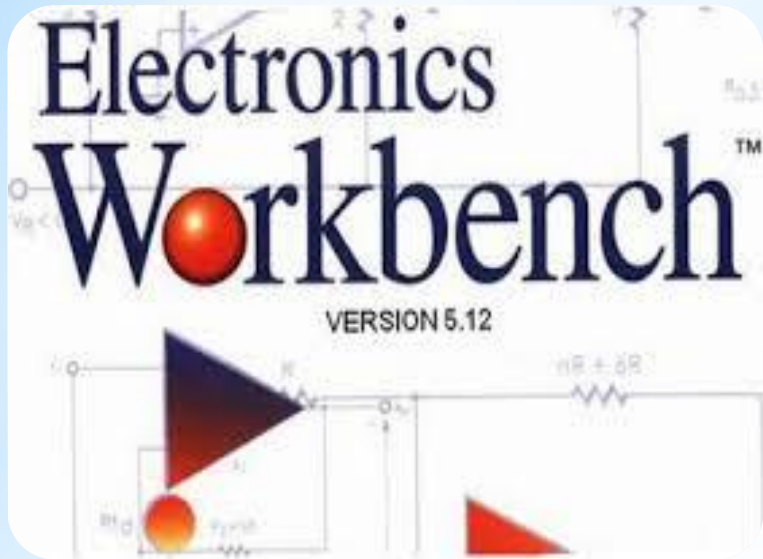


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1 function ye = kalmanf(A,B,C,Q,R,u,t,yv) %Weml
2     P = B*Q*B'; % Initial error covariance
3     x = zeros(size(B)); % State initial condition
4     ye = zeros(length(t),1);
5     errocov = zeros(length(t),1);
6     for i=1:length(t)
7         % Measurement update
8         Kn = P*C'/(C*P*C'+R);
9         x = x + Kn*(yv(i)-C*x); % x[n|n]
10        P = (eye(size(A))-Kn*C)'*P; % P[n|n]
11        % Compute output
12        ye(i) = C*x;
13        errocov(i) = C*P*C';
14        % Time update
15        x = A*x + B*u(i); % x[n+1|n]
16        P = A*P*A' + B*Q*B'; % P[n+1|n]
17    end

```





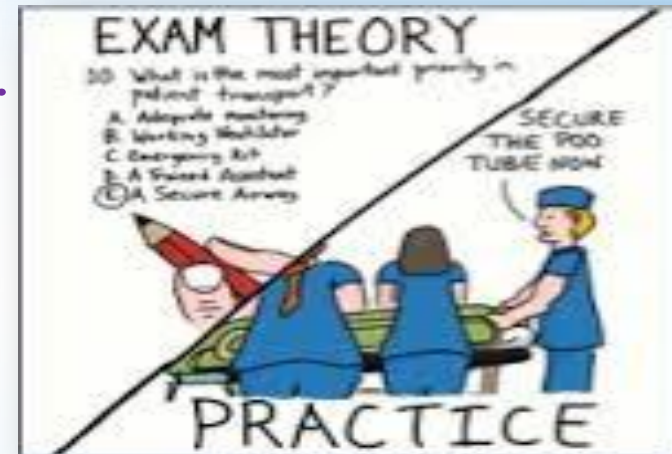
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How does Theory - Practice Bridge effects the Education Process?

The function of the engineering profession is to manipulate materials, energy, and information, thereby creating benefit for humankind.

- ✦ To do this successfully, engineers must have a knowledge of nature that goes beyond mere theory—knowledge that is traditionally gained in educational laboratories.
- ✦ Over the years, however, the nature of these laboratories has changed. So the presence of a good laboratories which associated with fundamental subjects will enhances:
- ✦ Student recognition of scientific materials.
- ✦ Influences in mind and more remember.



How does Theory-Practice Bridge effects the Electronic Engineering?

Electronics industry has recently witnessed a boom in all fields of technology and this follows the great technological development happening in the scientific field, as well as due to the need for all of these applications in medical, industrial, educational, and military fields. practical training increased students' understanding of theoretical knowledge and their motivation to study.



How does Theory-Practice Bridge effects

Graduation Projects in the Electronic Engineering?

There is only one real world. Theory attempts to make sense of it. Practice attempts to assume responsibility for it. Engineers' technical quality shines brightest when they recognize the limits of theory and design so that these limits become irrelevant.

The students acquired practical skills and knowledge in a working community of professionals. The results also showed that the students should be able to rehearse their reflective skills during the theoretical studies as well, because the practice period was too short to permit adequate development of reflective skills.

Examples of Graduation Projects in Electronic Engineering Dept.

