Information Communication Technologies in Engineering Education System to meet Industrial needs

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Abstract **The recent technical world demands highly sophisticated technocrats to meet society's needs. Many industries are flinging challenges to engineers in different areas. Consequently it increases theresponsibilities of the engineers to face all these challenges. Many Heuristic parameters need to be considered to meet all the needs and challenges of present Industries, Society, Entrepreneurship and many more. This requireshighly trained Technocrats. The present paper refers how to enhance the Engineering Education System (EES) and curriculum to train engineering students to meet all industrial needs? Some of the class room models are considered for evaluating EES.**

Keywords:*e-learning, ICT, Industrial needs, Engineering education, Curriculum.*

I. INTRODUCTION

Perception of engineering education is very important in present Engineering Education System (EES). It is very important to improve the EES in developing countries like India, to find healthy increment of economic growth. This is only can be achieved with well-trained students. By improving EES only, the engineering students can understand and practice the advance developments in new technologies. If the EES works effectively the prosperity of the engineering will reach the society in good manner and in right direction. Every individual must sense the objectives of the advanced technology.

Engineering is the discipline and profession of capturing and applying mathematical, technical andscientific knowledge to research, plan, design, invent and implement real world cutting edge technology using appropriate materials, devices, procedures and systems to achieve desired objectives efficiently [1][2][3]. The prominent engineering disciplines share intelligible knowledge in the areas of mathematics and industrial production[4].

In EES, class room teaching is one of the main criteria to make effective output. To implement all the knowledge in the above definition, some articulate methods are need to adopt in the engineering teaching process. This method includes regular black board teaching, seminars, quizzes, assignments, Case studies, laboratory study, Information Communication Technology (ICT) and project implementation. Excluding ICT remaining methods are traditional methods which are playing effective role in any education system. The new technologies do not remove the traditional methodologies. But new technologies increases effectiveness in learning process which will cause some more self-satisfaction in learners and trainers as well. New technologies do not change situations drastically, but it can start new ideas and approaches [10].

The ICT playing an important role in education system to reach the goal and satisfy the industrial needs with in less time and no wear and tear. In the present techno world the students need to study and analyse a long relational knowledge database. It is very difficult to study and search such long database. If the study material is available readymade with simulations, diagrams, and animations, it is very easy for the students to finish their tasks with in short span of time. Generally ICT enables enthusiasm in learners. A quality ICT tool provides sustainable education system in engineering colleges. ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information [7]". The Bloom´s Taxonomy should help trainers in creating curricula, understand, analyse, Evaluate, implement them correctly into the instructional process and remember [9].

Now a days the industrial growth is very large and studying all the developments creating complexity in education system, but the ICT enabled teaching methodologies enables both the learners and trainers more flexible in their respective jobs. Purchasing and performing some of the big, tedious and complex experiments with electrical hardware, Mechanical machines, Civil equipment and Chemicals is may not a comfortable job for learners even for trainer. It is a cumbersome process and involves lots of expenditures. Instead of doing this we can perform all those engineering operations with some graphical simulations. The simulation allows

the learner to understand real time functionality and analysis. The simulator software structure will be very interactive, interesting and user friendly. More significantly E-learning system improves and extends the learning and scientific opportunities for students [5].

Training the student as per the industrial needs is not that easy, and cannot be done in one year or 4 years. It is a continuous process where we need to develop over selves in various dimensions. The trainer should able to use internet for surveying right content in right direction dynamically. In future succeeding internationally requires cultural and economic understanding is no less than technological expertise [8]. Technology is responsible for society life, public health and renewable resources. So this is the responsibility of an engineer, scientist or industrialist to make proper balance between all those without losing ethics [8].

II. MOTIVATION

Some of the subjects need and highly required practical involvement in the regular teaching process. This gives a clear picture of the subject and creates interest in students learning process. Most of the industries are paying much attention in training young engineering graduates to meet their needs to par their industry requirements. If the same training could be given in the colleges, then the industries could save their part of the valuable training period time and save their training expenditures. Although the practical evaluation on physical machines or components is very important, but in some cases like conducting repeated practical session for the same batch to attain excellence, the institution where they cannot afford big budgets, space constraints in the organizations and many other issues are motivating to go beyond the regular on-board teaching, simple text and image presentation.

III. PROPOSED WORK

Many simulation Softwares are available to teach the subject in best method to give clear idea to the student. Many subjects are difficult to understand, but presenting it with simulations makes learner to grasp student concentration and make them to learn in joyful environment. The subjects like robotics involve many mechanical operations such as typical components like bearings, motors, shafts, grippers and many other interesting components. The subject needs methodical preparation to success in the exam and in the carrier if he/she selects the robotics as carrier objective. If the trainer uses some animations to explain the topics, the trainer can attracts the student attentions in the class room and can motivate the student to understand the subject clear. It also makes the students to remember the concepts for long time.

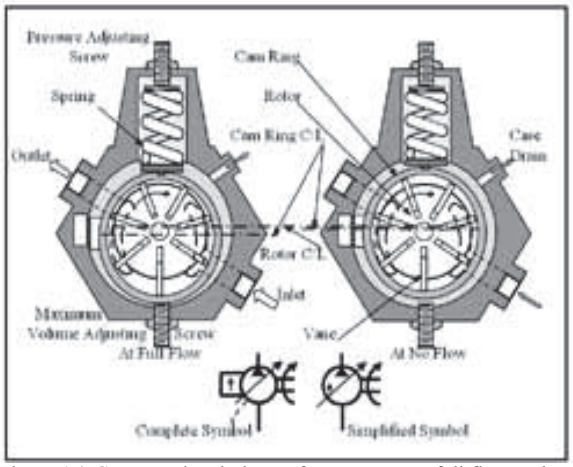

Figure 1a) Cross-sectional views of vane pump at full flow and at no flow

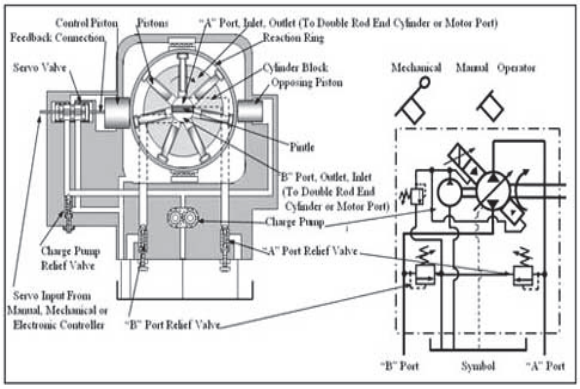

Figure 1b) Radial-piston pump used in bi-directional flow circuit

Figure 1 is showing some complex figures indicating some typical operations in pumps. Such type of diagrams is required very good and clear explanation in the class rooms. As they do not have immediate industrial exposure they need proper training in par with industrial training. Presenting direct diagrams using Power Point Presentations is good as it took long time in drawing such diagram on board and may not be precise with chalk and black board. This is somewhat can be manageable with live simulated animations which is show in figure 2 [6]. These are quite good when compared with Power Point Presentations in making the students learn more effectively.In the present generations not only simple animations are required interactive animations are required to meet ICT enabled tools. In courses like microprocessors the ICT enabled tools make the students participation more with interactive sessions. Figure 3 is showing the IO mode operation seeting in control register of Programmable peripheral interface (PPI) device. It is an interactive application which helps the user to enter choices for port and mode selections in PPI. With this interaction with the software an interest can be created in the minds of students. The student learns many combinations in short period and a pictorial representation develops the students to remember long time.

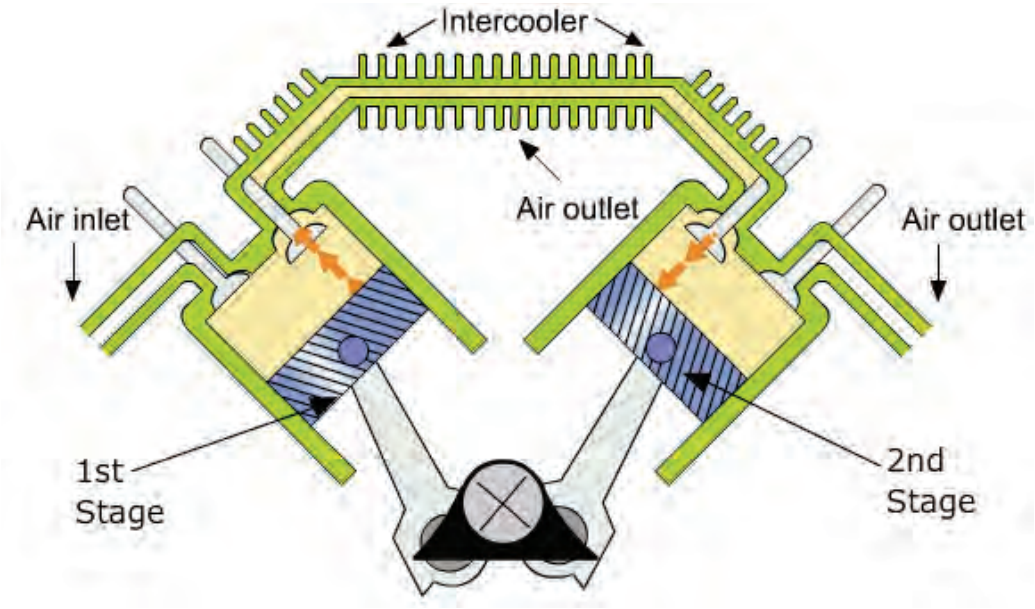

Figure 2: Two stage piston compressor

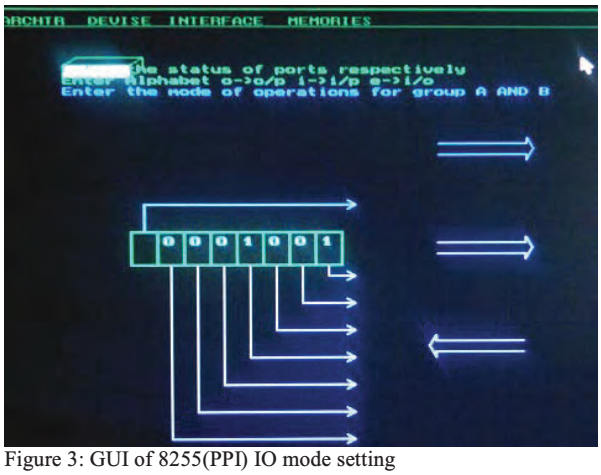

Figure 3: GUI of 8255(PPI) IO mode setting

IV RESULTS

The evaluation process is very difficult and has several inputs, such as quality of teaching, level of innovation, faculty expertise, and standard of infrastructure and resources available at the institution [11]. Many students are motivated to learn more and tried to apply subject in multidimensional in minimum given time (one hour or with in semester). Most of the students have come to the class rooms with the laptops, tabs and shared with their friends to solve class assignments. Although the pass percentage is same, but the pass percentage in higher grade is increased, which reflects good quality of the student. The logical thinking of a student also increased as learning objects are virtually present on the computer screen and the student can apply new ideas immediately without any physical or mental ruggedness.

V CONCLUSION

There are more power full tools are available in engineering market but not all are available to most of the engineering colleges. It is highly essential to provide ICT enabled tools in developing countries like India to meet 21st century trends. ICT enable tools include literature survey, logical thinking, soft skills, applicability, multi-disciplinary effective communication, social responsibility, team leading, and interpersonal capabilities. Although maintaining ICT enabled tools is costlier,but it is negligible when compared with the benefits and bright generation who need to cope with the next futuristic needs.

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