SUPPORT BASE FOR ELECTRICAL / ELECTRONIC INDUSTRY.

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ABSTRACT

It is a well recognized fact that our universities and institutes have produced engineers of high caliber while the talent and skill of our youth in this particular field have always been at the highest levels. However, the need for young mechanical, electrical and electronic engineers with entrepreneurial qualities, practical training and capability is being felt in the Sri Lanka industry today. Therefore, there is the need for the exposure of engineering students to applications and systems through industrial training more comprehensively and for reasonably long periods.

INTRODUCTION

What is an engineer's ambition?
What are his or her aspirations?
Engineers in the course of their learning should have a clear vision about what the industry expects from the engineer and the young engineer should also know what to expect from industry. A placid idea of gaining employment with the use of an engineering qualification will not bring forth an engineer who will make a significant contribution to the social and economic development of the nation. Engineering students should address their mind to the achievements of those great engineering personalities the world has produced in the past. It must be remembered that most successful entrepreneurs in the world have been engineers. Take for example the achievements of great personalities such as Henry Ford, George Stephenson, Graham Bell and Marconi to name a few who were the industrial giants of the past century. Take again the recent electronics giant Bill Gate. The contribution they have made as successful entrepreneurs towards the development of engineering science and the advancement of mankind should inspire the mind of every young engineer.

Knowledge of business and management including coverage in areas of accounting, costing and financial management should also be included in the educational curriculum of engineers. Engineers should be trained to be managers who will direct their efforts towards improving performance. This is most important in the highly competitive industrial sector. Electronic component manufacture is a typical example and improving customer satisfaction is a key factor of success. An engineer's knowledge of management techniques such as resource planning, performance, indicators and economies of scale will greatly improve the engineer's contribution to success of the industry by focusing attention on strategy and on factors necessary to achieve success.

SOLUTION ENGINEERING

Teaching and learning is a simple process at elementary level and what a teacher basically needs are some chalk and a blackboard to teach a class of students. Teaching aid is sometimes used to better explain a simple concept. Sticks and stones are even used in some schools to explain basic mathematics.

The learning experience takes on a whole new meaning when a student enters tertiary technical education in public universities or private colleges. At the tertiary level, the concepts being taught are no longer simple and teaching equipment are used to show the workings of real processes, machines, devices and gadgets being used in industries.

The tools of production had grown more complex since the start of the industrial revolution when the steam engine was the greatest innovation ever seen in human society. Steam power was the driving force in industry before the invention of the internal combustion engine and electromagnetic motors. The knowledge about industrial machines and equipment has grown so extensive; no technical subject taught at tertiary level can escape discussion on these marvels of technology. Teachers and tutors of technical subjects have adopted teaching methods that move students away from the classroom and into a laboratory filled with a wide range of teaching equipment.

There is also a growing need for students of the applied science to gain certain hands-on experience as the machinery, equipment and sensors in the real industrial world grow in complexity. Only teaching equipment can provide students with a close-to-real exposure to industrial processes.
The academic staff, trainers and students should work closely in the relevant industrial environment experiencing day to day practical operations on a "hands-on" basis. Theory as well as practice in industry in greater depth should be conducted simultaneously with equal importance. In this way an improved contribution from the universities can be achieved in forming the manufacturing support base in this particular sector of industry. Further, by this method of training of engineering students the tendency for young engineers to become mere administrators who do not function professionally as competent mechanical, electrical or electronic engineers may be avoided while their negative contribution is transformed into a positive contribution.

The young engineering graduates should have good practical background and knowledge as they pass out. This can be achieved ideally if the engineering faculty can imitate the medical faculty, that is students can follow practical sessions along with the lecturer, initially this may be well practiced, if an experienced engineer too get involved. These sessions may be arranged at the institutes or at suitable industrial sites.

Virtual Factors

The modern teaching equipment will not only mimic the functions of individual machines but whole production floors and factories. Called the Computer Integrated Manufacturing (CIM) system, it will be a strategic teaching equipment in institutions of higher learning offering manufacturing, design, computer aided design and manufacturing (CAD/CAM) related courses.

The modern advanced manufacturing systems incorporate robotics and state-of –the-art equipment. In the long term, CIM systems installed in universities, colleges, or Government institutions can also serve the business community as manufacturing R & D centers.

Since the CIM is still very much a conceptual manufacturing system, we have to first design a generic system with parameters that could be modified to fit different manufacturing requirements.
A typical CIM comprises several Computer Numerical Control (CNC) machines such as machines for milling, grinding, drilling and cutting of materials.

The system also includes Automatic 3D Inspection, Automatic Storage and Retrieval, together with robots for material handling and an Automated Guided Vehicle (AGV) for transferring and feeding materials from one machine to another. Among others, a CIM teaching equipment aims to replicate the functions of flexible manufacturing system (FMS) which is one of the important features of an advanced production system.

CONCLUSION

In conclusion, it has to be said that the engineers training should be focused on the needs of the industry keeping abreast of the fast changing technologies in a highly competitive commercial world. The education system should be directed and formulated towards the production of engineers with high technological and managerial competence combined with a wide exposure to the industry. Their education and training should be directed towards these attributes.
Our national industrial development to a great extent depends on the competence of our engineers and the foresight of our entrepreneurs

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Mr. Tisil Cooray who is chairman of the IE Group of Companies is a pioneer in the Electronics Industry in Sri Lanka. He has played an excellent role as entrepreneur cum engineer for many years and built a leading name for the products. His interest in Science & Technology began during his childhood when his interests were in electrical and Electronics devices and chemicals. After formal education and training in electronics and telecommunications in Sri Lanka, Mr. Cooray qualified further in Electronics and Navigational Aids abroad, having attended courses and training at the Air Services School in Canada and Department of Transport in the UK. Mr. Cooray has patented several designs and has won many national and international awards.