ABSTRACT

The paper emphasizes the need for industry academia interaction as one of the essential requirements for achieving the goal of international accreditation. The authors have identified four areas of existing collaboration with the industry and have sought to highlight measures for expanding such collaboration. The measures suggested include the launching of part time/evening post graduate courses for serving engineers on self financing basis, opening of community assistance centers, say, for small scale miners, strengthening of computation and library facilities for design, development and troubleshooting consultancy assignments for large industries, and expansion of extension activities in agriculture, forestry and health care sectors. Ambitious measures may not sound initially attractive, but it is necessary for a center of higher learning to think big even if the immediate outcome is not encouraging.

Key words: Industry, academia, accreditation, consultancy, agriculture, healthcare.

1 INTRODUCTION

In recent years, the PNG Unitech is trying hard for international accreditation of the university. It is natural for a university of more than 40 years’ standing, particularly when this is the only university of technology in the south pacific region. One of the important qualifying requirements for accreditation is close interaction with the industry. The university’s approach in this respect needs further strengthening. The authors analyzed several models adopted by the European countries [1-4]. In Europe the knowledge transfer between universities and industry takes place through several means, such as academic programs, common research projects, internships, seminars etc. The Inter-University Microelectronics Center in Leuven, Belgium, tried out innovative ways of knowledge creation and sharing such as support for individual spin-off companies, strategic collaboration with well known research institutes to virtual networking [1]. The modern relationship between the universities of technology and society in Romania are reported to be expanding by industrial and entrepreneurial actions [2]. A case study from the Czech Republic illustrates an example of interdisciplinary research and the linkage of university research with entrepreneurial working practice [3]. In Germany, examples of even closer linkage of universities with industry are available. For example, former students are employed by a company, but still work at university supervised by a professor on a common project [4]. The structure and organization of Microsoft Research Tablet PC and Pen Computing collaboration partnerships with academic institutions has been discussed in another interesting report, which highlights the vital role academia plays in the
future of computing [5]. Many other models are available. However, the models adopted by highly industrialized countries may not be applicable to a newly developing country like PNG. The present paper therefore attempts to analyze the methodology being adopted in PNG so far and seeks to highlight the areas where more intensive efforts are necessary.

2 CURRENT APPROACHES

The university is currently trying to interact with the industry in several ways. These efforts may be summed up as follows;

(i) Manpower training
(ii) Extension service to small scale miners and small scale industries
(iii) Consultancy service to large industries
(iv) Interaction in agriculture, forestry and healthcare sectors.

All these approaches are bearing fruits. However, further strengthening of these is necessary for (a) creation of industrial training and job opportunities for the graduating students, (b) industrial exposure of teachers and sourcing industry sponsored research and development facilities, (c) upgrading the curriculum of the university to suit the needs of the PNG and the south pacific region in general and (d) fund generation for the university.

3 METHODOLOGY

3.1 Manpower training

Currently the subjects for the training programs are generally selected by the teachers themselves, based on their individual expertise. In many cases, the programs are repeated to train a larger number of industrial/ semi government organization personnel. The scope of such programs needs to be broadened. One possibility is to start part time/ evening post graduate courses. In view of the boost in mining, oil and gas exploration and shipyard construction activities, the Lae city and its surroundings have been attracting numerous technically qualified personnel. In addition the existing mining and mineral processing industries engage engineers on flying in and flying out basis. If a proper survey of the potential for starting need based post graduate course is conducted the overall response of qualified candidates for joining such part time/ evening post graduate courses may be assessed. The courses may either be industry specific or general in character based on the response received. Industry specific courses have been a great success in India. For example, one of the Indian Institutes of Technology started a post graduate program in Steel Technology, where only candidates sponsored by the steel industry with full financial support are admitted. After completing the course work, students usually work on the live projects in their own industry under a joint supervision of a teacher from the participant institute and an expert from the relevant industry. Such arrangements is mutually beneficial, Not only the students qualifies for his post graduate degree/ diploma, the teacher also gains valuable experience in industrial problem solving. Several other institutes work on a different pattern, they normally combine their regular post graduate students with the part time students from the industry with the stipulation that the part timers will take less load per semester and may therefore complete the masters’ program in three to four year. Such industry oriented programs in many cases need to be interdisciplinry in character. For example, a mining engineer also needs to possess some background in mechanical, electrical and electronics engineering as well as in business accounting and management. Naturally therefore the faculty has to be drawn from several departments, with one department coordinating the program. Since the curriculum for such a program is multi disciplinary, the students may also be drawn from all relevant specialization. The curriculum, therefore, will have to be split into basic preparatory courses and
specialized courses to suit the needs of the individual students. Such post graduate programs are generally self financing. Either the students, who are working professionals, pay enhanced fees to meet the expenses or their employers pay the fees. In either ways such programs have been very successful in India and be tried out in PNG Unitech.

PNG Unitech has already initiated an experiment on arranging Master classes by inviting experts from the industry on specific subjects of mutual interest. The students have welcomed this program wholeheartedly. In view of such encouraging response this program need to be expanded for effective transfer of practical experience and knowledge.

3.2 Extension Service

The extension service currently offered to small scale miners and small scale industries is based on the request for such industries or the individuals themselves. However, there is a scope for expanding such service through establishment of community polytechnic. Once again, an example may be drawn from the mining industry. In PNG small scale miners usually extract gold by the amalgamation process. During the final stage of extraction the mercury is usually is boiled out. Since the cost of mercury is quite high and the mercury vapor is a positive health hazard, an effort may be made to train people in a safe method of recovery of gold from the amalgam, wherein the mercury is also recovered by condensation and recycled for the further use. Similar approaches are possible in other technical disciplines as well. A case in point may be extraction of carbon from waste plastics and preparation of charcoal from the coconut shells. The Appropriate Technology Center of the Unitech already has some facilities. It may need some expansion or modification to accommodate trainees from the micro/ small scale industry sector. There is a wide scope of similar extension services in mechanical, instrumentation, civil, and electrical engineering. The PNG Chamber of Mines and Petroleum is whole heartedly supporting the mining engineering department of the university in creating an improved infrastructure, superior lab facility for the students and enhanced extension services to both small and large industries.

3.3 Consultancy Services to Large Industries

Such consultancy services may be broadly categorized into (a) design, software development and simulation jobs and (b) laboratory based investigation and industrial trouble shooting assignments. In the former category inadequacy of computation and library facility of the university is a serious bottleneck. This deficiency needs to be removed as early as possible. It is well understood that any such developmental work needs huge funding, which is the main constraint. But it may also be argued that such investments would pay for themselves in future. It may not be possible to take up large jobs at the moment but something is definitely is possible. For example has the necessary competence for satellite data processing for various applications. Similarly the mechanical engineering and applied physics department may very well collaborate with mining engineering department in the area of underground mine ventilation and air conditioning. These large projects may be split up into a number of small undergraduate student projects whereby the students also get an opportunity for hands on training in live industrial projects. It is heartening to learn that the university has already collaborated with some large industries in the country, but with the growth of petroleum mining and mineral processing sectors, the supporting industries like mechanical, electrical and instrumentation industries are bound to grow as well. The university may therefore consider creation of the appropriate infrastructure for such collaborative projects on a priority basis.

3.4 Extension Service to Agriculture, forestry and healthcare sectors

A report of Department for Environment, Food and Rural Affairs, Government of UK [6], highlights advantages and contribution of livestock farming and associated supply chains in sustainable development. The report calls for (a) support for farming and the encouragement of sustainable food
production, (b) enhancing the environment and biodiversity to improve quality of life and (c) support for a strong and sustainable green economy resilient to climate change. The report further points out that concerted efforts of three main stakeholders; the government through its various agriculture research departments and support agencies, industry and farmers is very much vital in achieving a sustainable development. The potential for this sector is enormous in PNG. The land in PNG is fertile and rainfall is adequate. It has wonderfully rich grassland resources, making the ability of livestock to turn into a real significant source of good dairy products and of high dietary value for human consumption as we grapple with feeding an ever increasing global population. Much livestock can be maintained on grasslands that are unsuitable for arable crops. The faculty of agriculture and the forestry department are the most competent people to comment on the scope of this sector, but as visitors to this country, it appears to us that cattle farming is one area which requires more attention. In India and Bangladesh, every village household maintains a few cattle for agriculture, milk production and meat supply. Even the carcasses of the dead cattle provide resources. The hides are sent to the tanneries for leather preparation while the bones are ground to prepare phosphate fertilizer. With so much of greenery all around, PNG possesses enormous opportunity for cattle forming, while a university of technology needs not get directly involved in such activities, it may create a cell for training of trainers for cattle forming.

In the health care sector, the applied physics department has been running a course on radiation physics for training of qualified health care personnel. The scope of this training program may be further widened. One area where the applied physics department may competently collaborate with medical personnel is in application and interpretation of electromagnetic and ultrasound waves. In advanced countries, interpretations of electromagnetic responses from the brain are being analyzed to identify specific disorders in brain functions. Exposure to magnetic and electro-magnetic fields has also emerged as an advanced technique for bone and spine healing [7-9]. Ferro-fluid loaded drop capsules have been successfully guided under externally applied magnetic field to specific healing points in the physiological systems [10]. The applied physics faculty, with their knowledge of the fundamentals of electromagnetic waves, may be well placed for the collaboration with the medical doctors in such health care efforts. It may be worth mentioning that the development of MRI machine itself owes its origin to development of rare earth magnets through the sustained efforts of physicists and metallurgist.

4 CONCLUSIONS

The paper has tried to highlight the scope of industry academia interaction in PNG. Although some of the ideas mooted in this paper may appear to be of tall order, it is also true that universities all over the world teach their faculty and students to think big. Ambitious approaches may not yield immediate results, but some results do emerge when we learn to think in a big way.

REFERENCES


