

INTERNATIONAL LINKAGE IN ENGINEERING EDUCATION

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Abstract

Sending members of the faculty of educational institutions of third world countries to first world countries for short training programs is vital to the upgrading of Engineering education. Participants in such programs are exposed to and so observe firsthand the varied modern technology in the advanced countries, thereby learning from such educational experiences. Faculty members from a country as the Philippines, can greatly benefit if sent to a first world country as the United States.

However, for all the advantages, the program has to deal with three major problems: first, the high cost of sending faculty members to the U.S., or other advanced country; second, knowing the particular subject area the faculty will need to learn more of and whether such subject area is available in the school to which he will go, and whether the knowledge ultimately gained can be used when he returns; and third, seeing to it that the faculty really studies that he actually learns while undergoing training abroad.

This paper addresses these problems and presents the methods by which they may be solved. The solution to the specific problem is simple and explained. It is envisioned that this paper will foster the interest of schools in third world countries and encourage them to send their faculty members to technologically advanced countries. Knowing how it is done, costs will be minimized and learning maximized when the faculty are sent abroad for international training.

Introduction

Most Engineering schools today are staffed with faculty who teach only what they learned when they were students themselves. This is an age when technology advances at a very fast rate so what had been learned only a few years back soon lags behind. Teachers, specially, have to constantly study as to learn and keep abreast of current and relevant technologies. So, what must be done so that our teachers are updated and become more efficient and effective mentors in this fast-paced technological world?

One method of upgrading the knowledge and knowhow of faculty members is to have them attend seminars or conferences. If speakers are effective, the participants will learn a lot from such seminars and conferences. However, the time allotted for the speakers is usually short,

and therefore inadequate for a thorough coverage of the subject matter the teacher teaches. This is because most faculty members attend one day to a maximum of five days of seminars or conferences.

Another way is to read the latest books on the subject the faculty teaches. Although teachers find this method convenient, it is limited by the constraints of time and finances. Like everything else, books are costly, more so in the Philippines where a good, hardbound book can cost as much as forty percent of a month's salary of a typical engineering faculty. A well-stocked library, if available, can be a great help, but again, very few libraries with plenty of books exist. Even if books are available, a teacher may not have enough time to peruse them to gain enough knowledge. A teacher has to read plenty of books to really learn from them.

The use of the Internet as a tool in the learning process is now essential in Philippine Engineering schools. While there is no question as to its efficiency and efficiency, most schools do not have access to its use. For one, only a very few schools can provide their students enough computers; laptops are out of the question since it cost beyond the means of both faculty and students. CPU increased the number of PC stations the students can use to ease the problem in this institution.

The second problem is associated with the knowledge faculty members must possess in order to use the internet as a teaching tool. In the College of Engineering some of the faculty members who have gone for international training are using the internet as a tool. They are still the minority of the total number of faculty of the College. It is therefore very important for more faculty to be exposed on the use of the internet as a teaching tool. The third problem is using computer software is present in most engineering schools in the Philippines today. This is because of the excessive cost of the software used unless a free ware is used.

There is the concept of having faculty from advanced countries come to the Philippine and undertake a training program for a school's faculty. Two problems are associated with this method: one is the cost involved in having a faculty come to the school. It would take from \$16,000 to \$20,000 if the visiting faculty is on sabbatical leave; if not, it could be more. The other problem is the fact that the visiting faculty may not be knowledgeable on the educational program of the Philippines. Whatever knowledge he or she may share, may not be needed by the institution. It is therefore very important that a careful process be done to identify the needs of the school and what the visiting professor can deliver.

Another way of answering the need of the faculty to undergo advance training is to send them abroad for short durations of at least two to three months. There is a distinct advantage when a faculty is sent abroad and exposed to Engineering education in a first world country as the United States. He will not only learn from the lecture and laboratory classes he or she attends but also observe how each school operates as well as how students and faculty interact/in or out of the classroom. The faculty cannot be tempted to stay abroad because he could not have adjusted to life in the U.S. in such a short period; besides, he is expected to be back to share the knowledge he gained. This, so far, is one of the best method of training the faculty to gain knowledge and expertise in Engineering education.

Problems

In every endeavor, problems are certain to be encountered. It takes money to send people anywhere, so the first problem is the cost the program will entail. Most of the time this problem is solved if the government gives a grant for the faculty to undergo a short training abroad. In this case, the faculty receives a fixed amount on which to undergo training. If a faculty is sent on a training program on government funds, but in an area which is not necessary or needed in his school, it fails its purposes. Another solution is for a school to secure a government grant and do the planning and allocation of funds. This method allows the school to minimize costs but involves a lot of tedious paperwork.

To send faculty abroad the first and foremost need is to identify the school in the first world country (such as the United States) which will accept faculty members from third world countries to undergo training in. The training will be for three months, or one tri-semester. The identity of the school must be known beforehand to make sure that the faculty member is going to the right school and the right training. This is especially true in the U.S. where most engineering schools are research-oriented rather than practice-based. A teacher from a third world country, if sent to one such school, may not learn much from the training because of its being research-oriented.

This could reduce the impact of the training to a minimum. Otherwise all efforts exerted by the school in terms of costs, training, coordination, and substitution will be rendered useless. It is of the utmost importance that the right school for a faculty from a third country to attend in first world country, should be identified first. It has been determined that technological schools are similar in orientation to Engineering schools in the Philippines.

The school to which they will go and the areas they will train in must be identified beforehand. From time to time their performances will have to be checked and the problems they encounter on their training solved.

For these reasons, it is necessary to have a coordinator who can see to it that the program runs effectively. The coordinator should be knowledgeable about the area where the training will take place. It is the coordinator who will scout around for the school the faculty will undergo training in, making certain that its program include the areas the participants will train in.

To be effective, the coordinator should be well acquainted with the present state of Engineering education in the schools of the third world country. This is true if the coordinator comes from a third country and migrates to the United States; or he can come from a first world country and live long enough in the third world country as to be familiar with its way of life and educational system.

Once the school is identified, the coordinator will look for the school in the first world country which will accept faculty members for training. When this is done, the coordinator will

send a letter of acceptance for the faculty of the third world country. This letter of acceptance is important when applying for a visa to enable the faculty to go to the United States. Next, the coordinator will look for the facilities to house the faculty during their stay in the country for the training program. He welcomes and orients the faculty members when they arrive; he assists in their admission to the school. He monitors their performances, seeing to it that they learn to the maximum possible. The coordinator will also find out if the tuition & fees of the faculty who undergoes training will be waived. The classes which the faculty leaves when sent abroad, will be taken over by a substitute teacher, who will be paid accordingly.

The last but important aspect in sending a faculty abroad is the costs, which include transportation from the point of origin (in this case, Iloilo) to the United States and back; the expenses he will incur while in the United States --- board and lodging and other incidentals. Finally, the charges of the school which will train the faculty.

In all of these areas expenses will be incurred; cost reduction is crucial since the main objective of the program is to reduce costs to a minimum while the faculty undergo relevant training. This can be done by reducing as much as possible expenses in all areas and sending the participants only to the right schools.

Solution

In 1999, the College of Engineering of Central Philippine University, was chosen as Center of Development I in the areas of Chemical Engineering, Civil Engineering, electrical Engineering and Mechanical Engineering. For being chosen COD I school, it was given a grant of \$20,000.00/year for the next three years for each program. In January 1999, it received the initial release of \$35,000.00.

The fund was used to really improve almost all aspects of Engineering education. Among these were: faculty upgrading, institutional improvement, purchase of books and equipment; outreach and research, especially. In planning how to use the funds, it was decided that a part of it will be used by the faculty of the College to undergo short training programs in the United States. The training would be for a maximum of three months. The purpose was three-fold: to minimize inbreeding, to expose the participants to Engineering education as done in the United States, and so learn to teach updated and modern aspects of Engineering, on their return.

A former member of the faculty of the College of Engineering Dr. Ted Robles who now teaches in the Milwaukee School of Engineering in the United States, was contacted. He was asked to help identify a US school to which the CPU College of Engineering could send its faculty to undergo training. Dr. Robles suggested the Milwaukee School of Engineering.

The College of Engineering agreed that the Milwaukee School of Engineering (MSOE) would be ideal for Central Philippine University to send its faculty to. MSOE is a technological school and so is practice-based and not a research-oriented school of Engineering. Philippine Engineering schools are similar to such technological schools. The faculty can learn from schools such as the MSOE modern, relevant training they can use on their return. What the faculty will

learn will be maximized so that the cost of sending them abroad will be justified.

A Memorandum of Understanding was signed by both the Presidents of the Milwaukee School of Engineering and Central Philippine University, allowing faculty members of the College of Engineering to undergo training at MSOE free of charge. In the same manner the Memorandum also provided for a faculty of MSOE to come to CPU and undertake seminars every now and then; aspect of the Memorandum has been implemented, and a total of three seminars had been undertaken by a faculty of MSOE at CPU.

To eliminate the hiring of substitute teachers, the faculty were sent only in March – the end of the Second Semester until May. The school save at least \$1,000 per faculty member. The faculty did not miss any of their class day since they made provisions to end their classes by the end of February, and the regular classes ended in the middle of March. Make-up classes were held so that the same number of lectures were delivered to the students. April and May are months in summer when CPU does not require the faculty to teach.

To reduce expenses further, all aspects of the program which entailed costs were examined. The costs of applying for a visa and transportation was evaluated and a travel agency which could offer the least expenses was used.

The Philippine government grants a minimum of \$3,000 to a maximum of \$4,500 per month of allowance per person. This will be for board and lodging as well as incidental expenses. The typical tuition and fee paid by the Philippine government for the faculty to undergo training in the U.S. is between \$5,000 – 10,000. The total estimated costs for sending faculty members to the U.S. would be around \$14,000 to \$24,500.

Cost reduction was beneficial because it would send only four members as the first batch. The total cost per person was only \$3,750. The costs were greatly reduced because MSOE did not charge a training fee. Dr. Robles was able to get an apartment which accommodated the four faculty members together; they cooked their own meals. Under this arrangement, a substantial amount was saved by the school. The savings financed more faculty participants to the training program.

Conclusion

A total of seven faculty members have been sent to the training program in the Milwaukee School of Engineering. In March 2003, another batch of three faculty in ME and CE will go. An additional one or two members will be sent in 2004. The sending of the additional three members is possible because expenses of the first batch was reduced to a minimum. If the undertaking was by the government guidelines and funds, the number sent would have only been three, instead of the seven who had been sent and the four who will also be sent.

The faculty members who have been sent abroad have returned and some changes are visible. First, their outlook is now global in nature; they are no longer limited by their local horizons. Next, the faculty sent abroad learned the latest trends so well that they are applying them in their teaching. A very noteworthy aspect they have also brought back is the use of

innovative and advanced methods of teaching. Some of the faculty have started using the internet as a teaching tool, are teaching other teachers how to do it.

The program is not without unexpected bonuses, too. A member of the MSOE faculty donated \$5,000.00 to the CPU College of Engineering. A faculty member who went abroad brought back a sizeable number of Engineering books, some of which were given to the faculty for reference; some were donated to the library for both students and faculty to use. MSOE also donated some of its equipment and peripherals for use in the Engineering laboratory.

Today, if we are asked if all the labor and the expense were worth the sending of the faculty of the College of Engineering to train abroad, the answer would be a resounding yes. It involved difficult and tedious processes, but the goal was successfully achieved – even bringing on unexpected but welcome bonuses.

In presenting this paper, it is hoped that other schools will be encouraged to send their faculty abroad to train. The training program the faculty underwent abroad is giving Engineering education at CPU a big improvement. One can only surmise what greater impact it will have on other Philippines schools as well as the rest of third world nations. Engineering schools with faculty who are updated on current trends of education are dynamic and efficient parts of the machine of progress vital to a country.

In closing, this paper is presented in recognition of the selfless assistance of Dr. Ted. Robles who pioneered, coordinated, guided and donated resources to the linkage program. His work was the main reason why the program has been successful. Without his assistance this program would never have succeeded. Without his assistance the cost would have been enormous and prevented the sending of faculty members to MSOE. The College of Engineering of Central Philippine University, would like to dedicate this paper to Dr. Ted Robles and Milwaukee School of Engineering for the unselfish efforts of helping a third world country engineering school have its faculty exposed to a modern technology.

Bibliographical Information

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