Work in Progress: Lessons from Virtual Supervision of Engineering and Computer Science Graduate Students – Case of Addis Ababa University

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Abstract - In this paper, we document the case of a virtual/remote graduate student supervision the author carried out at the Addis Ababa University, Ethiopia from the US over a period of two years. The theses of three engineering and two computer science students at the MS level were successfully supervised in this period. At one point, this virtual supervision of students at the computer science department of Addis Ababa University (AAU) by external faculty at the US had accounted to almost one-third of the supervised MS theses in the whole department. Lessons on the adoption of similar collaborations between US universities and overseas universities is also investigated and reported.

Index Terms – Virtual education, distance learning, international collaboration, international education.

INTRODUCTION

The emergence and unprecedented growth of the Internet over the past several years has opened up new possibilities for collaboration between international universities and US-based institutions of higher learning. Among these possibilities, the infrastructural support that the Internet provides for a joint or external remote supervision of graduate student thesis from these international universities by professors in the US is the focus of this paper.

Over the years, two overriding factors have contributed to the immense need for external instructional and research support at universities in developing countries. The widely recognized brain-drain problem from developing countries has been the major contributor [1,2] whereas the increase in enrollments in institutions of higher learning in developing countries has contributed as much to this shortage of university-level researchers and educators.

To address these problems, several attempts have been made by policy makers as well as the individual universities, sometimes even at departmental and college levels [3]. In early 2002, such an initiative was taken where a memorandum of understanding was signed between volunteer US-based educators and the department of computer sciences at the Addis Ababa University (AAU), Addis Ababa, Ethiopia to jump-start an external thesis supervision program of master’s level graduate students. Around the same time, a similar but informal agreement was reached between the same external advisory group and the structural engineering group at AAU to initiate a master’s thesis supervisory arrangement. These two initiatives, it was hoped, would help alleviate the severe shortage of qualified professors that the university was facing at the time graduate enrollment in engineering and computer sciences had increased.

With the successful graduation of the first batch of five graduate students from these pilot programs, this paper investigates the success and failure areas and draws lessons learnt that are directly applicable to similar international initiatives.

SURVEY METHOD

The major stakeholders in this initiative, i.e., the graduate students, were contacted for filling out a comprehensive survey questionnaire to gauge their assessments of the outcomes. The questionnaires were communicated through electronic mail and the results collected through the same way. The questionnaire was distributed to five graduate students at the Addis Ababa University. Two of the students come from the civil engineering program while the other three students come from the computer science and informatics programs. Opinions from the faculty who participated in the external supervision are also included, wherever appropriate. The survey assesses, in detail, the key features such as learning outcomes, the adopted methods and technologies, infrastructure challenges, follow-up and quality controls, and usefulness and relevance of the final thesis products in securing employment for the students.

RESULTS

The following tables summarize the results from the survey.

1. Learning Objectives

The graduate students were asked how they would rate the satisfaction of the following learning objectives through the external thesis supervision. In general, the students seem to agree that the outlined four learning objectives have been met...
at somewhere between “excellent” and “very-good” levels. One student commented that this remote thesis supervision has “definitely brought me from a poor level of communication accompanied with fear to excellent level of communication in addition to enabling me adopt some important traits like politeness, which are important in virtual communication”.

The students also emphasized that the virtual nature of communication had some unique demands such as the advisor’s patience and ability to understand the student’s communications as textual communication alone may suggest different meaning from what the writer wanted to say. Another aspect of the relationship between graduate students and professors that came out of this survey is the fact that students may not have previous experience in communicating with researchers and professors at such level of serious professional interactions. Handling such disciplined interaction with a remote advisor was cited as one area where the students felt they picked an additional skill set.

2. Learning Outcomes

The graduate students were asked how they would rate the satisfaction of the following learning outcomes through the external thesis supervision. In general, the students seem to agree that the outlined five learning outcomes have been met at somewhere between “excellent” and “very-good” levels. Some students commented that they have benefited from a requirement by the advisors of continually improving language skills. Close supervision, getting sufficient feedback on time, and the interesting nature of research work were cited as stimulating improvements in skills in software programming or computational methods – areas of expected learning outcomes. Further, close interaction with the advisors, continuous and detailed feedback at each and every step were also cited as important factors in enhancing organization and goal setting skills.

3. Methods and Technologies

The graduate students were asked how they would rate the satisfaction of the following methods and technologies through the external thesis supervision. Again, in general, the students seem to view the methods and technologies applied in these remote supervisions quite favorable giving them ratings between “excellent” and “very good” levels.

Discussions

The survey questionnaire, we believe, has been very helpful in gaining insight to how the graduate students themselves who participated in this external Internet-supported remote thesis supervision assessed its success. The opinions from the remote advisors were also helpful in gaining additional perspective. In general, the survey results indicate a strong sense of a successful remote thesis supervision program in terms of meeting the desired learning outcomes and objectives. The methods and technologies used in the remote supervisions were also well rated despite infrastructural problems in the host university and country. However, there is no comparable data on how other graduate students in the same programs but under local thesis supervision viewed their own experiences. This may require a detailed and extensive survey that is beyond the scope of this paper. Despite that, however, there is strong indication that Internet-mediated remote supervisions could work and contribute to cross-breeding of useful ideas and improving the depth and breadth of thesis subjects available to graduate engineering and computer science students in developing countries.

Conclusions

The paper demonstrates that virtual or remote supervision of MS level students in engineering and computer science at the Addis Ababa University by US-based external faculty members contributed significantly in cross-breeding of useful ideas and improving the depth and breadth of thesis subjects available to graduate engineering and computer science students. The assessment of the success of the program was based on a survey of the graduates of the program as well as the external advisors themselves. The survey results, in general, demonstrated that the students felt that the learning outcomes and objectives were successful giving the initiative a consistent ‘very good’ to ‘excellent’ rating (the highest rating used in the survey being ‘excellent’). The methods and technologies received similar rating but the infrastructural problems such as unreliable Internet access were cited as factors having an impact on the quality of the final product. The survey also demonstrated that the students were satisfied by the quality control mechanisms set attributing closely followed scheduling and breakdown of tasks into manageable units as the factors that helped the success of remote supervision. The issue of securing employment and how much the remote supervision helped towards that were investigated with the survey results indicating that all the students were able to find employment immediately after graduation with one candidate deciding to pursue a doctoral level study in the US. Finally, lessons on the adoption of similar collaborations between US universities and overseas universities were also investigated and reported.

References

