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Editorial Open Access

Removing Barriers to Promote Human Factors & Ergonomics Education in Developing Countries

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Editorial

"Human Factors" concerns fall under the purview of "ergonomics" which is associated with occupational health, safety, productivity, and performance management. Human Factors and Ergonomics (HFs/E) movement started when engineers and top level managers realize that industries had to adjust with workers' psycho-physical and cognitive capabilities to the technological systems in various industries and companies. HFs/E was primarily focused on the country's work-regulated agencies, or on the effort of National Institute of Occupational Safety and Health (NIOSH) to prevent work-related accidents and injuries. Recently, HFs/E issues and concerns drew worldwide public attention. It is also an emerging issue for the design and improvement of products, processes, and operations. Hence, there are significant interests in promoting HFs/E programs in university education. Currently, ergonomics related courses are taught in a few universities and colleges. A number of universities in the developing countries are offering diploma program and delivering certificate courses. However, the existing program may not address contemporary and current and local issues of HFs/E and concerns of socio-cultural, economics, and anthropometrics. Currently, it lacks quality assurance and bias in academic policies and procedures. There are confusions and conjecturers about launching for an effective and standard HFs/E program in each of the developing nations. HFs/E program usually consist of interdisciplinary subjects that should be delivered by acknowledged experts in the individual subject areas of expertise. Interdisciplinary HFs/E program thus incorporates contributions from different areas of sciences and technology. Whatever the case, understanding of the theory of HFs/E is an integral component of the HFs/E practice that should be enhanced by collective experiences through industry involvement and community participation. We also require academic commitments and community involvements to initiate a new program. And thus, co-curricular activities in the program are believed to be better preparing graduate students for the regional job market. Hence, the program should provide students with the skills they really need to develop and evaluate human-technology-environment systems. Many academics in the developing nations are not sure about how the course curriculum will succeed given the poor laboratory facilities or lack of qualified lecturers. The program actually needs to focus on understanding of HFs procedures and ergonomics principles, as well as HFs/E guidelines to meet the future prospects of human centered system design. The program should be designed according to the educational needs and aspiration of the demands of HF/E professionals in each of the developing countries. The program itself should be expected to significantly impact local business, education, and technology. The program should also introduce topics of current HFs/E knowledge from individuals' skills and knowledge those are actively involved in developing products, process and operations. Effective and standard course curriculum and hands-on-training module is one of the vital needs for both lecturers and students. The program should therefore be prepared in such a way that it is a career focused and service oriented program. For this, a questionnaire survey should be conducted among the industrial entrepreneurs and prospective students enrolled for industrial engineering, psychology, human-computer interactions, and so on. Courses also should combine human engineering, user-usability, cognitive sciences, and ethnography, physical, environmental, psychosocial and economic issues. Thus, each course should include theoretical studies, laboratory experiments, testing, fieldwork, practicum, and assignments. The lecture topics should be integrated with the standard curriculum that fit into local industry and company needs. In this regard, company managers and industrial engineers should be invited to teach chapters. Chapters should be included to explore generic concepts and specific applications from case studies in diverse community working in agriculture, manufacturing, oil and gas industries. Program specific and the faculty specific courses should also examine local issues (socio-economic, behavioral and cultural) for implementing HF/E applications and guidelines. Low-cost intervention examples are to be added in the chapters to reduce the challenges of implementing HF/E application in various types of workplaces. The courses should be synchronized with technological advances and the present and future demands for HF/E skills needed for developing countries. Also, the courses should be comprised a science core, design core, and a job-specific component customized to fit our graduates for the skills they need for industry employment. Changes should be made within the university curriculum considering local industry need and requirement of country's job market. We should prepare students not only for HF/E career development (www.hfes.org/web/Students/career.html) but also train them in such a way that they are able to implement HFs/E measures by extending decision-making capabilities and advise management on potential liabilities. In the first year and a half of the program, students should complete the whole course work of around 30 to 36 credits. Industrial attachment training will then be done in the final year as a part of students' final thesis and practicum of at least 6 credits. Every student should be assigned to a committee member, and individual project (in the attachment training) maybe intended to integrate HF/E procedures and methods. At the end of the course, graduates would then be able to extent their personal skills, experiences and decision-making capabilities in the design and development of products, processes and industrial operations. For new expectations of each of the country's industrial growth, HF/E programs should bring socio-economic prospects for the community and the region. Regional professional societies and associations must be consulted with, and other concerned parties should be involved in launching HFs/E program. A deeper insight should be given priority into overcoming the challenges of

implementing an educational program in their own community. For this, we need to more clearly articulate the message of how to uncover barriers to HF/E adoption in the region. We should allow readers to better understand how to know if their educational program is having the impact they hope for. We must describe the successes and challenges of the implementation in the context of the specific barriers faced in developing nations. Again, the goal of improving the quality of HF/E education in developing nations is a commendable one. This editorial is believed to allow readers to glean ideas about how to overcome local barriers of launching HFs/E program. It serves as a guide to readers wishing to implement HFs/E program in the communities. Suggesting metrics of measuring the impact of the HFs/E program, this editorial is perhaps lack to bring more new ideas and thoughts explicitly. Initiating such a specialized and accredited program like HFs/E discipline, we believe that it will surely increase academic diversity of educational institutes. The authors thus believe that HFs/E graduate program will meet those needs and aspirations of each of the developing nations and reduce barriers to implementing HF/E practices in the region. This is considerable due to rapid industrial growth and industry employment opportunities in the region. Identifying major benefits of promoting such programs in university education, this editorial thus highlights potential recognition of enhancing HF/E education in the region.