PROGRAMA MECE EDUCACION SUPERIOR UCH0403:
Renewal of Civil Engineering Programs at Universidad de Chile and Pontificia Universidad Católica de Chile

Report summarizing visit of Dr. Valquiria Villas Boas*
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Activities

In October 2007 I visited the Facultad de Ciencias Físicas y Matemáticas de la Universidad de Chile and the Pontificia Universidad Católica de Chile for approximately one week. Activities included:

- October 2nd 2007: Meeting with members of the Faculty Training Group, more specifically with Dr. Rosa Uribe (faculty trainner), Dr. Gianna Vallebuona (Department of Mining Engineering) and Dr. Nicolás Beltrán (Department of Electrical Engineering) from UCH. In the projects developed by the two universities (UCH and PUC) within the scope of the MECESUP program, various aspects of the teaching-learning process, such as teaching, learning and assessement, have been taken into account by a large number of professionals of the education area. At UCH the Faculty Training Group has worked within the areas of methodology, curriculum, evaluation and interaction in teaching-learning environments, in order to generate a new teacher´s vision of interaction in the classroom. At Universidade de Caxias do Sul (UCS), we also have a group which is in charge of faculty training, but the methodology of the UCS group is reasonably different from that of UCH. At UCS only new faculty are invited (and obliged) to participate in seminars (every other week for 4 months) where people discuss the need of introducing new methodologies of teaching and their own way of teaching. On the other hand , at UCH the faculty training group gives counseling to all faculty who thinks he (or she) is in need of changing his (or her) way of teaching. In any case, during our discussion we agreed that our main objective (both at UCH and PUC and at UCS) is to promote a change from the traditional way of teaching to a methodology of active, flexible and significant construction of knowledge, skills and abilities that allows the students to face the problems and needs of engineering nowadays.

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•October 2nd 2007: Meeting with Sergio Celis (Deparment of Industrial Engineering), Héctor Agusto (Department of Civil Engineering) and Jorge Castillo Guzmán (Deparment of Chemical Engineering). These professors teach “Introduction to Engineering” to first year students and to students that have chosen their specialty in the 6th semester at UCH. We discussed the differences between the Chilean and the Brazilian engineering programs. I apported my experience as a professor for 8 years at the Universidade de São Paulo (USP), the best university in the richest state of Brazil, and as a professor for 4 years at the Universidade de Caxias do Sul (UCS), a community university in the southermost Brazilian state and in the city of Caxias do Sul that is the second metalurgical center in the country. The students at UCH are similar to students at USP, which means that they are mostly full time students that had the best high school formation in their respective countries . At UCS, the population of students is mostly composed of people employed in the industries of the region and seeking engineering degrees. UCS offers degrees in mechanical, chemical, materials, industrial, environmental and food engineering, Most of the students at UCS come to class in the evening after a long day at work, many of them unmotivated and incapable of paying attention to a traditional class. The strategies used at UCH, in both “Introduction to Engineering” course for first year students and for students that have chosen their specialty in the 6th semester, are inspiring and maybe can help to decrease the drop out rate at UCS. I was impressed at UCH with the commitment to give all first year students a motivating “taste” of engineering. I was also impressed with the creativity of some of the project ideas we discussed, and with the desire to make the projects connect to real-world problems.

•October 3rd 2007: A two-hour workshop entitled “Innovator or Profesaur” at a conference entitled “XXI Congreso Chileno de Educación en Ingeniería”. We all know that engineering professors must be prepared to participate in the technological teaching-learning revolution. Nowadays we teach a new generation of students where most of them are digital natives. In this paradoxal situation, most of the students are digital natives and most of the teachers are still in the Stone Age of teaching. Most of the engineering professors also are still digital immigrants. For students to learn in a meaningful manner, they must be actively engaged in the learning process and this must be the main goal of a higher education teacher. The main objectives of this talk was to share with the participants a collection of techniques that have been used in engineering and higher education. Besides implementing technological resources in our classes, we can innovate by using very simple and well-defined instructional techniques that can make teaching more effective. These techniques can be introduced slowly and methodically, without compromising coverage of the syllabus. They do not require large expenditures of money, time, and

effort. This workshop was attended by 20 faculty members from different Chilean institutions (UCH, PUC, Universidad Católica de Valparaíso, Universidad Santa Maria, Universidad Católica del Norte, Universidad de Concepción, etc...) and also from Argentina, Colombia and Equator. The workshop was very active with a rich exchange of experiences among people from different countries and different backgrounds (engineers, physicists, mathematicians, designers, educators, political scientists and students).

- October 3rd to 5th 2007: Attendance at the "XXI Congreso Chileno de Educación en Ingeniería", which was hosted in Santiago by the Facultad de Ciencias Físicas y Matemáticas de la Universidad de Chile. As mentioned above, at this conference I ran a workshop entitled "Innovator or Profesaur". I also participated in other workshops, I attended all the major invited talks and a significant number of presentations, and I met and interacted with leaders and faculty members from other engineering programs in Chile, Argentina, Colombia, Equator and USA.

- October 8th 2007: Presentation of a talk, entitled "Recent Advances in Permanent Magnets" at the Pontificia Universidad Catolica de Chile. This talk highlighted some of the new developments in high performance permanent magnets. Nanocrystalline rare-earth – transition-metal based permanent magnets are my subject of research. I shared with faculty members from UCH and from PUC some general results on high performance permanent magnets and also some results of my own research.

Final Remarks

I really appreciated my visit to UCH and PUC and my participation in the "XXI Congreso Chileno de Educación en Ingeniería". Despite the fact that UCH and PUC are institutions of the same level as the Universidade de São Paulo, where the best students in both countries are being educated, we can see that at UCH and PUC, the leaders and the faculty members are much more aware of the necessity of doing something in the areas of curricular innovation, new methodologies in the teaching-learning process and faculty training. They are devoting impressive energy and enthusiasm to future curricular innovation and continuous improvement of the teaching-learning processes of these two institutions. I hope I can transmit some of the wonderful ideas people shared with me to the leaders and faculty members of my institution, the Universidade de Caxias do Sul. Thanks a lot for this opportunity!