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Impetus from Bremen for sustainable raw material extraction in Chile and engineering education

University of Arturo Prat and Bremer Institut für Produktion und Logistik at the University of Bremen begin joint venture research project / Focus on: Logistics and sustainability in the extraction of raw minerals, as well as Serious Gaming within academic teaching

Scientists at the BIBA – Bremer Institut für Produktion und Logistik GmbH and the University of Arturo Prat (UNAP) in Iquique, Chile are teaming up for a two-year joint venture project on sustainable mining of raw minerals. They are also aiming on cooperating long-term on the education of engineers.

From Copper to Rare Earth: Optimizing mining processes as a way of conserving resources

A visiting scientist from Chile was the first emissary. While writing his dissertation at the BIBA, the Chilean logistics researcher realized how Bremen Know-how (especially about the sustainable design of supply chains) could be of interest for raw mineral extraction in his home country. Following an initial scientific exchange, the current joint venture project "Expanding Green Supply Chains through the example of raw materials" deals with collaborating within the area of sustainable use of resources in supply chain processes that are found in mines. At the same time, these scientists are studying the processes that are paramount to mining copper, as well as keeping an eye on the extraction of other raw materials.

Through this joint venture project, other UNAP investigations to scout out new mining deposits have begun. Together with a UNAP geologist, the project partners are assessing their options for obtaining Rare Earth, very rare and valuable metals. In the future, the findings of this venture could conserve Rare Earth from mining waste in a sustainable process.

Analysing processes, comparisons, and learning from one another

Bremen scientists are especially qualified in the study of internal and overall company processes within the areas of business, production and logistics. At the base of these studies is the world-renown GreenSCOR Model (Supply Chain Operations Reference-Model – SCOR). This model is used, with a sustainability-focused lens, in the development of standard methodologies.

Through an analysis and description of the processes based on this model, a comparison of the different processes in various companies originates, through which the respective optimization potential in each establishment is identified and through which appropriate measures in the Supply Chain Management can be used. Matthias Kalverkamp, BIBA project manager, says „It's important here, for the environment and the best possible use of our resources, to link knowledge and learn from each others' experiences."

The German Federal Ministry of Education and Research (BMBF) supports this project in the context of the Research for Sustainable Development programme, part of the Scientific and Technological Cooperation (German: WTZ). Germany aims at "participation in international research programmes for solving global problems, expanding and improving bilateral relations and access to interesting research regions". Among other things, the program focuses on technology export and, importantly, market development for small and medium sized enterprises.

Kalverkamp adds: „Through this collaboration, we can discover valuable insights into our logistics research, gain deeper knowledge in increasingly important fields, and can expand our international cooperation. This also benefits the European scientific community and economy."

German university students might also profit from this collaboration

In addition, the Chilean scientist at the BIBA familiarized himself within the Gaming Lab with the forms of teaching and learning engineering education at the University of Bremen. Here, the BIBA develops and tests various Serious Games with a focus on production and logistics. These Serious Games foster the intelligent linking of various skills, and students learn to act and make decisions based on real, complex situations within a gaming context. The BIBA Gaming Lab offers research facilities and businesses a platform for the use of simulation games for education and training.

The scientist took his enthusiasm for Serious Gaming back to Chile, and UNAP now seeks cooperation not only in academic teaching, but above and beyond their assisted projects as well. The first steps have already been taken. While visiting UNAP in November 2013, Kalverkamp was not only present for the official project kick-off, visited various copper, molybdenum, and iodine mines, and swapped ideas with UNAP professors about process management, but also taught several Serious Gaming labs.

„The resonance with the UNAP professors and students was outstanding. Even the press reported on the events", says Kalverkamp. The medium-sized University located in northern Chile sees Serious Gaming as an innovative teaching method that has the potential to supplement engineering education very well. With around 11,000 students, this field offers great potential for the collaboration between UNAP and BIBA. The partners are already conceptualizing expansions to the Gaming scenarios, so that they can be put into effect in several locations worldwide. With this, students from both Bremen and Iquique could work together as well as experience aspects of global collaboration instantly. The vision: international classes and seminars. Yet Kalverkamp remarks, "There is still research and development work required". Both BIBA and UNAP are currently seeking the means to expand this commitment.

(Translation: Anna-Elise Anderson)

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Press release photos can be found at www.biba.uni-bremen.de/pressemitteilungen.html or by contacting Sabine Nollmann (Cell: +49 170 904 11 67 or E-Mail: mail@kontexta.de)

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In an Copper and molybdenum mine Chuquicamata in the north of Chile.
Photo: Matthias Kalverkamp, BIBA

Serious Gaming in UNAP seminar room: future engineers are learning, playfully confronts with real, complex situations making decisions.
Photo: Matthias Kalverkamp, BIBA