

CRITICALITY ASPECTS IN EDUCATION FOR THE EUROPEAN RAW MATERIALS VALUE CHAIN



JUAN M. MENENDÉZ AGUADO

**Professor,
University of Oviedo**

After decades of relying on third countries, more than 15 years ago the EC started a process of perspective change to mineral raw materials production, which culminated with the approval of the EU CRM Act. This process focused mainly in the material capacities and knowledge capacities in Europe, and how the legal framework had to change to start or maintain production activities could be performed without losing the green approach, but also without compromising our production chains.

This process had a time frame coincidence with a general decay in the social interest for classical engineering degrees, especially those specifically related with Mining and Metallurgy, generating an scenario of criticality in terms of high skilled EU workforce availability.

The presentation will reflect on the following aspects:

- 1) Which social paradox we need to solve to be effective in RM communication activities
- 2) How we can change social perception about mining and metallurgy in an effective way
- 3) Which skills must be developed in our students to face the challenge

Juan Maria Menéndez is a Full Professor of Mineral Processing Technology at the University of Oviedo, where he has held various academic positions: Assistant Professor (1999-2004), Associate Professor (2004-2021), and Full Professor (since 2021). He is also the Director of the Asturias Raw Materials Institute, established in 2023 at the University of Oviedo.

Prof. Menéndez has participated in over 120 projects funded by both private and public institutions, covering research, technology transfer, and academic pursuits. His work has resulted in more than 90 scientific publications, with over 60 appearing in indexed reviews, and he has supervised 21 PhD theses.

He has served as a visiting professor at more than 15 universities across Argentina, Chile, Colombia, Cuba, Ecuador, Peru, and Venezuela. Since 2004, he has been a member of the Society for Mining, Metallurgy, and Exploration (www.smenet.org), and since 2013, he has been a member of the Society of Mining Professors (www.miningprofs.org).

*A more detailed CV can be found at:
www.unioviedo.es/juanm*





INDUSTRY PERSPECTIVES ON TALENT REQUIREMENTS

Keliber | Europe | Sibanye-Stillwater
(sibanyestillwater.com)





BRIDGING STUDIES TO PRACTICE



VILMA LAITINEN
Sustainability Expert,
Nordkalk

This presentation discusses the views of a sustainability expert in the mining industry on university studies and how to combine them with practice. It covers what has been useful and what could have been learned more effectively.

Vilma Laitinen is a sustainability expert at Nordkalk Mine in Lappeenranta, Finland. With a background in consulting, she has extensive experience in Life Cycle Assessment (LCA). Vilma holds a master's degree in environmental engineering, which she earned in 2020.





ACADEMIA-INDUSTRY COOPERATION FOR ADVANCING BUSINESS GOALS



SALLA PYHÄJÄRVI
Partnership Coordinator,
RDI Specialist,
Lapland University of
Applied Sciences

Universities of Applied Sciences engage in close cooperation with organizations across various sectors. This collaboration generates benefits for both parties, including research, development, and innovation opportunities, as well as facilitating the exchange of expertise. By actively engaging with industry professionals, educational institutions acquire current industry-specific knowledge and insights, enriching their curricula and thus fostering synergy.

The collaboration offers businesses the opportunity to promote internship positions and thesis topics to university students, as well as to connect with future professionals.

Salla Pyhäjärvi serves as a Partnership Coordinator at Lapland University of Applied Sciences (LUAS) and specializes in Research, Development, and Innovation (RDI) within LUAS' TEQU innovation concept. Her role involves identifying, establishing, and fostering collaboration between LUAS and organizations across different industries to promote business growth. With a decade of experience in business cooperation and development, she spent eight years in human resources and recruitment across various sectors before transitioning to academic and project research work for the past two years. Salla earned her Master of Business Administration from Lapland University of Applied Sciences in 2019.





EXPLORING POSSIBILITIES IN VOCATIONAL MINING EDUCATION AND TRAINING



VELI T. PYHTILÄ

**Lecturer,
OSAO Taivalkoski**

This presentation “Exploring Possibilities in Vocational Mining Education and Training” briefly brings up the current state of vocational education and the extent of the degree structure, presents various future possibilities for the development of the mining sector and the training of professionals. This process may include various general, structural or innovative methods.

Future research, development and innovation activities in the vocational mining education will likely be implemented through extensive cooperation in the form of simulation, extended reality, artificial intelligence, automation and autonomous systems in various projects.

The vocational education sector has its own recognized strengths and new, excellent solutions for the future mining environment can be found through the development of regional systems and also through international operations.

Veli T. Pyhtilä is a seasoned lecturer at the OSAO Vocational Institute, with over ten years of experience in the field of education, particularly in mining and earthworks programs. In addition to teaching, his responsibilities have included development work and project management. Before this, he gained experience in his own business, research, sales, management, officer, and employee positions. Pyhtilä earned his MSc degree in Civil Engineering from the University of Oulu in 1991 and has also studied land surveying.



STRENGTHENING EDUCATION THROUGH COOPERATION IN JOINT PROGRAMS



RITVA TUUNILA
Associate Professor,
LUT University

MARIA MAMELKINA
Development Manager,
LUT University

Recently at LUT University, more focus has been addressed on developing high-quality joint Double (DD) and Triple Degree (TD) programs with highly recognized partners. In these programs, a student studies 1-2 semesters in each partner university, does a jointly supervised bachelor's or master's thesis in one partner university or industry, and finally from DD or TD gets respectively two or three degree certificates, one from each university.

Compared to a semester of student exchange, when a student selects his/her exchange university and studies courses by him/herself, these joint programs are well-planned entireties in selected partner universities leading to the desired degree with a special curriculum. Getting several diplomas is another advantage of joint programs compared to student exchange.

For joint DD and TD MSc programs in Chemical Engineering at LUT, vast attention is paid to close industrial cooperation through the studies. In practice, selected industry partners of the field participate already in developing the program and curriculum, commit to

giving visiting lectures on several courses, offer topics for project works and theses, and offer internship and master's thesis opportunities for students studying in the program. For students, in joint programs, we can provide fascinating opportunities to develop skills to work globally, expand the network, get close industry connections already during studies as well as prepare for advanced studies. Moreover, exposure to diverse cultures and educational systems fosters a global mindset, which is increasingly important in today's interconnected world. For companies, collaboration in joint programs ensures that the curriculum includes the skills and knowledge most relevant to their sector, and enhances young professionals' recruitment through internships, project work, and other cooperation activities. Additionally, aligning academic curricula with industry needs can reduce onboarding time and training costs for young talents.

Ritva Tuunila is an Associate Professor of Process Engineering at LUT University. With over 20 years of experience, she has taught numerous process engineering and simulation courses ranging from bachelor to postgraduate levels. Additionally, she has served as the Head of the Chemical Engineering degree program for seven years.

Maria Mamelkina serves as a Development Manager at LUT University, focusing on innovation and overseeing the implementation of joint international Double Degree and Triple Degree programs, including MEITIM, ENTER, and SBBE, among others.





VALUE CHAIN PERSPECTIVE IN MINING EDUCATION



SAIJA LUUKKANEN

Professor, Oulu University

The transition to a low-carbon society is a challenge that requires huge amounts of metals and minerals needed for clean energy solutions. The availability of raw materials is highly adversely affected by challenges related to the efficient use of resources, such as high energy and water consumption, high CO₂ emissions, environmental issues and social resistance. It is clear that here is a need to maximize resource use efficiency by extracting the maximum possible value from the mined products and to improve the awareness of sustainable exploration and mining, which could improve general social acceptance of the efficient use of critical raw materials in relation to the clean transition. All of this requires more professionals who have a comprehensive view of the entire mine lifecycle and sustainable mining operations and related disciplines. In addition to educating young students, updating and increasing the knowledge of the people working in different areas of the mineral sector, including environment, social and governance aspects, is expected to lead to more sustainable operations throughout the mining industry value chain.

Saija Luukkanen, the director of the Oulu Mining School, has been a professor of mineral processing at the University of Oulu's Oulu Mining School since 2015. She transitioned to this position from the consulting company Pöyry, where she served as Business Development Director in the Mining and Metals BU, working in both Peru and Finland. Throughout her career, she has also worked for the Geological Survey of Finland (GTK Mintec) as the team leader of the Flotation and Separation group and at Lafarge in France as a project manager. She has a background in physical chemistry and received her PhD in 2000.

