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Innovative Training in Critical Raw Materials: The IMMERSE Project's Role in Advancing Education for the Clean Energy Transition

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In the energy transition era, the supply risk of critical raw materials (CRMs) must be addressed with strategic efficiency and expertise to address the pressing challenges of climate change, increasing resource demands and to support the objectives of the European Green Deal. Strengthening local production and promoting the sustainable management of CRMs is essential to reduce reliance on imports and ensure a resilient supply chain.

As the emphasis on sustainable resource practices increases, the demand for skilled professionals to oversee the responsible and secure extraction of these materials is increasing. However, a major challenge in Europe is the shortage of qualified professionals in the mining and mineral resources sector. Universities have been identified as playing a pivotal role in addressing the deficit in professional training by adopting innovative learning and teaching methods. The integration of advanced digitization technologies into educational frameworks is a key aspect of this, ensuring that students are equipped with the knowledge and skills necessary to support the sustainable development of the mining industry.

The IMMERSE (Immersive Virtual Tours on Critical Minerals for Clean Energy Transition) project constitutes an innovative educational initiative focused on the development of Virtual Excursions (VEs) to enhance learning in the CRMs sector. This collaborative project brings together leading universities from Europe and Australia to address the skills gap in mining and geoscience training by employing cutting-edge teaching approaches that prioritize sustainability.

The VEs serve as cutting-edge educational tools that allow students to safely engage with scenarios that are otherwise difficult to access or present safety concerns in real-world environments. By replicating real mining environments through immersive online experiences, VEs allow students to explore ongoing research and industry practices without the constraints of geography. These virtual platforms encourage the exploration of sustainable practices and innovative solutions to today's mining challenges, aligning educational goals with industry needs.

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