

PROGRESS REPORT

Deliverable 6.3



Horizon 2020

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Authors:

Manuel Regueiro and Luis Jordá (IGME)

Contributions by:

Philipp Hartlieb (MUL), Vitor Correia (EFG), Jelena Vidovic (EGS), Krishnan Subramani (EGS), Marco Konrat (LPRC)

Project coordination

Manuel Regueiro and Luis Jordá

Spanish Geological Survey. Instituto Geológico y Minero de España- IGME

Calle Rios Rosas 23, 28003, Madrid, Spain

Phone: +34 – 913495700

www.igme.es

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Intermin project partners

 Instituto Geológico y Minero de España	INSTITUTO GEOLÓGICO Y MINERO DE ESPAÑA	IGME	ES
 EUROGEOSURVEYS The Geological Surveys of Europe	EUROGEOSURVEYS	EGS	BE
 brgm	BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES	BRGM	FR
 ASGMI Asociación de Servicios de Geología y Minería Iberoamericanos	ASOCIACIÓN DE SERVICIOS DE GEOLOGÍA Y MINERÍA IBEROAMERICANOS	ASGMI	ES
 LPRC LA PALMA RESEARCH CENTRE	LA PALMA RESEARCH CENTRE FOR FUTURE STUDIES SL	LPRC	ES
	UNIVERSIDAD POLITÉCNICA DE MADRID	UPM	ES
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 AGI american geosciences institute connecting earth, science, and people	AMERICAN GEOLOGICAL INSTITUTE	AGI	US
 THE UNIVERSITY OF QUEENSLAND AUSTRALIA	THE UNIVERSITY OF QUEENSLAND	UQ	AU
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1. INTRODUCTION

This first progress report presents the preliminary findings during the 15 months of research. The objective of this report will let all project's stakeholders to know the current situation and evolution of the project.

1.1 SUMMARY

INTERMIN will create a self-sustainable long-term lasting international network of training centres for professionals. The project involves educational and research institutions in the EU and the leading counterparts in third countries, based on specific country expertise in the primary and secondary raw materials sectors. The network will map skills and knowledge in the EU and the third countries, identify key knowledge gaps and emerging needs, develop roadmap for improving skills and knowledge, as well as establish common training programmes in the raw materials sectors. In line with the EU's strategy for international co-operation in research and innovation (COM(2012)497), the consortium will seek international collaboration, fostering and exploring synergies with the relevant EU Member States initiatives.

1.2 PROJECT SCOPE

The project has the following specific objectives:

1. To develop common metrics and reference points for quality assurance and recognition of training;
2. To develop a comprehensive competency model for employment across the raw materials sector;
3. To introduce an international qualification framework for technical and vocational training programmes;
4. To create a conceptual framework for the development of joint educational training programmes based on present and future requirements by employers and
5. To create and launch a joint international training programme by a merger of competences and scope of existing training programmes in order to optimize future interaction and collaboration in Europe and internationally with the help of the INTERMIN online educational platform. Further, to build up this network INTERMIN will signpost critical disconnects between available education and employers' needs, and it will advance short

and medium-term actions to close current skills' gaps and enhance existing education and training at the international level.

On the long-term, INTERMIN will enable mutual recognition of curricula, and will foster cooperation between employers, educational institutions and professional organisations to craft technical and vocational training programmes that offer continuing professional development and address future qualifications and skills' needs.

The INTERMIN international network of technical and vocational training centres for professionals will ensure that common resources are leveraged to their best potential to create training programmes that match the needs of raw materials' employers and professionals. Collaboration will take full advantage of specialisation/capabilities of the network members, communication technologies and globalisation, hence using the Educational platform to deliver interactive online services that provide trainers and learners with information, tools and resources to support and enhance training delivery and management.

1.3 PROJECT TECHNICAL DESCRIPTION & IMPLEMENTATION

INTERMIN will tackle the shortage of a raw materials' skilled workforce in Europe by advancing a holistic approach, taking into consideration:

- 1) Current and future employers' needs (assuming different contexts and technological scenarios) and available skills provision;
- 2) The dynamic balance of demand and educational supply in different world regions; and
- 3) The alignment of training and industry cyclicity.

The methodological approach combines collection of primary data (surveys, interviews) and secondary data (desk research and benchmarking) for advancing a new paradigm for optimized interaction and collaboration between training centres, employers and professionals. The paradigm of INTERMIN will integrate an international qualifications framework (based on the European Qualifications Framework) and a competency model, both tailored for the raw materials sector. The foresight on future employers' needs will follow a qualitative approach, combining scooping of scenario field and cause and effect analysis with projections and cross impact analysis using modelling software. This will allow anticipation and leveraging of change, and the development of a robust roadmap on skills provisioning for the raw materials sector. The combination of desk research, experts' insight, and competitive and functional benchmarking will feed in an Action Plan on the enhancement of existing education and training

and the development of joint international technical and vocational training programmes. The delivery of those programs will be supported by an IT platform that will provide trainers and learners with information, tools and resources to support and enhance training delivery and management. This methodology is appropriate to generate a long-lasting international cooperative network of technical and vocational training centres. A detailed description of the implementation of the project, phase of the project, main milestones and outcomes are included in the table included in the next page:

CALL AIMS	APPROACH	ACTIONS	OUTPUTS	IMPACTS
<p>Build on international cooperation;</p> <p>Map skills and knowledge in the EU and in mining advanced countries;</p> <p>Identify key knowledge gaps and emerging needs;</p> <p>Develop roadmap for improving skills and knowledge;</p> <p>Establish common training programmes in the raw materials sectors;</p> <p>Create a self-sustainable long-term lasting international network of training centres for professionals, involving educational and research institutions in the EU and the leading counterparts in third countries, based on specific country expertise in raw materials.</p>	<p>Holistic approach, combining:</p> <ul style="list-style-type: none"> • Match-making between skills provision (available education) and employers' needs; • Balance of regional demand and educational supply; • Alignment of training and industry cyclicality. <p>Advance of a paradigm for optimized interaction and international collaboration between training centres, employers and professionals.</p>	<p>Defining a skills catalogue for the raw materials sector (WP1);</p> <p>Mapping and collecting worldwide information on existing technical and vocational training courses for raw materials industry professionals - including mid-level and professional skills, alongside high-level skills (WP1);</p> <p>Development of a international repository of existing training courses for the raw materials sector (WP1);</p> <p>Identification of existing gaps in education and training outcomes, considering existing and future employers needs (WP2);</p> <p>Integration of the appraisal of existing and emerging skills needs, and recommendations from past and existing EU projects on skills provision for the raw materials sector, in a robust roadmap on skills development (WP2);</p> <p>Definition of a comprehensive competency model for employment across the raw materials sector (WP2);</p> <p>Definition of best training practices and reference points for quality assurance and international recognition of training (WP3);</p> <p>Immediate enhancement of existing training programmes, by filling existing gaps (introducing new topics) and incorporating training best practices (WP3);</p> <p>Development of joint technical and vocational training programmes for professionals (WP3);</p> <p>Designing the international network of raw materials training centres, and the corresponding strategic plan and infrastructure (WP4);</p> <p>Create an Online Educational platform for the raw materials sector (WP4);</p> <p>Expand the international network of raw materials training centres (WP4 and WP5);</p> <p>Dissemination and engagement with current and new stakeholders (WP5).</p>	<p>Definition of existing and emerging skill gaps in the raw materials sector (D1.1, D1.2, D2.1)</p> <p>Creation of a 'Integrated Competency Model' for employment across the raw materials sector, defining the required mixes of skills, with capacity to proactively anticipate and adapt to changes in the skills mix (D2.3);</p> <p>Definition of a 'International Qualification Framework' for the raw materials sector, fostering the balance between global demand of professionals (by employers) and the offer of alumnae/graduates from mid-level, technical and professional courses (D3.1, D3.2, D3.3);</p> <p>Definition of a 'Action Plan' to close skill gaps and enhance existing education and training programmes for professionals (D3.4);</p> <p>Creation of a 'Roadmap' to tackle medium and long term skills' needs (D2.2);</p> <p>Alignment of training agendas and curricula in Europe and worldwide, and development of cooperation plans among training providers and between them, the industry and professional organisations (D3.5, D4.4);</p> <p>Leveraging international cooperation on the provision of talent into the raw materials sector by setting an international network of raw materials training centres (D4.1, D4.2);</p> <p>Optimized interaction and collaboration among training centres throughout an open online Educational platform (D4.4);</p> <p>Promotion of continuous professional development in the primary and secondary materials sector (D3.3).</p>	<p>Implementation of the Raw Materials Initiative and achieving the objectives of the EIP on Raw Materials, in particular in terms of establishing and maintaining strong and sustainable relationships with the leading training institutions in the relevant countries;</p> <p>Increasing the EU competence and expertise in the field of the primary and secondary raw materials;</p> <p>Improved availability of qualified and skilled workforce leading to higher competitiveness of the EU raw materials industry;</p> <p>Enhancing the possibility for new cross-sectorial innovation;</p> <p>Fostering international cooperation;</p> <p>Generate a feasible, long-lasting international network of technical and vocational training centres for raw materials' professionals.</p>

2. RESULTS ACHIEVED IN THE LAST 15 MONTHS

2.1 WP 1 – WORLDWIDE MAPPING OF EDUCATIONAL-RESEARCH PROGRAMS (ATLASES)

Skills catalogue (IGME): The deliverable 1.1 entitled “skills catalogue for the raw materials sector” was uploaded to the ECAS system. This is a comprehensive document including the skills required in the mining sector as well as main learning outcomes from the University courses. For the drafting of the document we compiled experts opinions from different countries and stakeholders groups (mining companies, research institutions and training centres and universities) using as a base several existing docs (Australian Qualification Framework, Spanish Agency for the Evaluation of the Quality and Professional Accreditation docs). The deliverable designed a new hierarchical logic of the skills-to-job description model, so the system could be used in the future INTERMIN platform adding the possibility of dropdowns menus, more suitable for the online QUESTIONNAIRE. The following map summarises the replies by countries included in the catalogue up until today

Database on training centres and questionnaire (MUL)

During July and August 2018 a beta test of the training centres questionnaire was shared among an expert group including the Advisory Board and external stakeholders. With the insights of this test and a shorter version of the skills catalogue we launched the online questionnaire to the stakeholders and database and also posted in the intermin website¹. We recognized that the skills catalogue is useful for the analysis of the skills needed but too comprehensive for launching a “rapid” questionnaire. The skills catalogue was therefore shortened in a meaningful way to not overload the recipient of the survey. The skills catalogue was also compiled and translated into Spanish (2 versions: English and Spanish for the LATAM training centres and universities) for including a wider (not English-speaking community). This online survey / questionnaire was sent out to “the world” = everybody dealing with raw materials education worldwide in September 2018. Currently we have more than 220 responses coming from 92 countries of the world, making this a very conclusive insight into all existing raw materials education programmes. The results are transferred to a **web-interface**. This interface is also described in D1.2 and can be found under <http://interminproject.org/preliminary-survey-results/>. The users can interact with this interface, click on different icons and browse through the content. **¡Error! No se encuentra el origen de la referencia.** shows the general layout of this interface. By e.g. clicking on one teaching language, all relevant programmes which are offered in this language can be displayed (**¡Error! No se encuentra el origen de la referencia.** gives an example for Arabic

¹ <http://interminproject.org/2018/10/02/please-contribute-to-our-short-survey/>

language). In this way the users can scroll through all relevant content and compile an evaluation / output in their own interest.

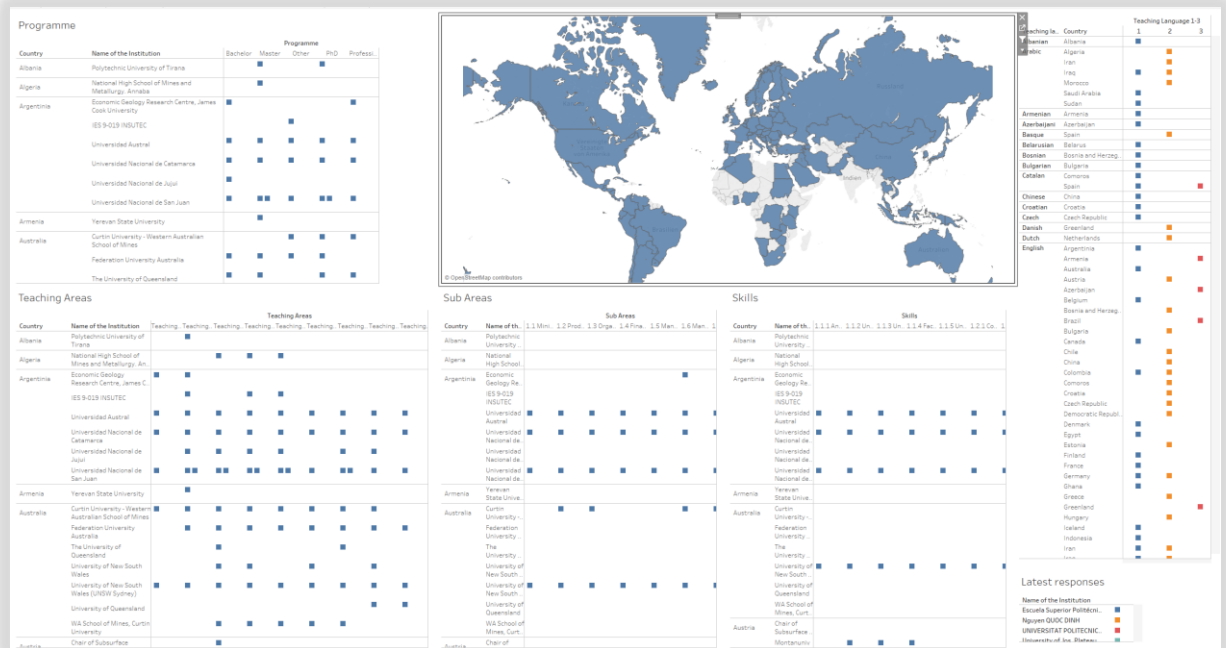


Figure 1: Overview of the Tableau Dashbord used for data visualisation.

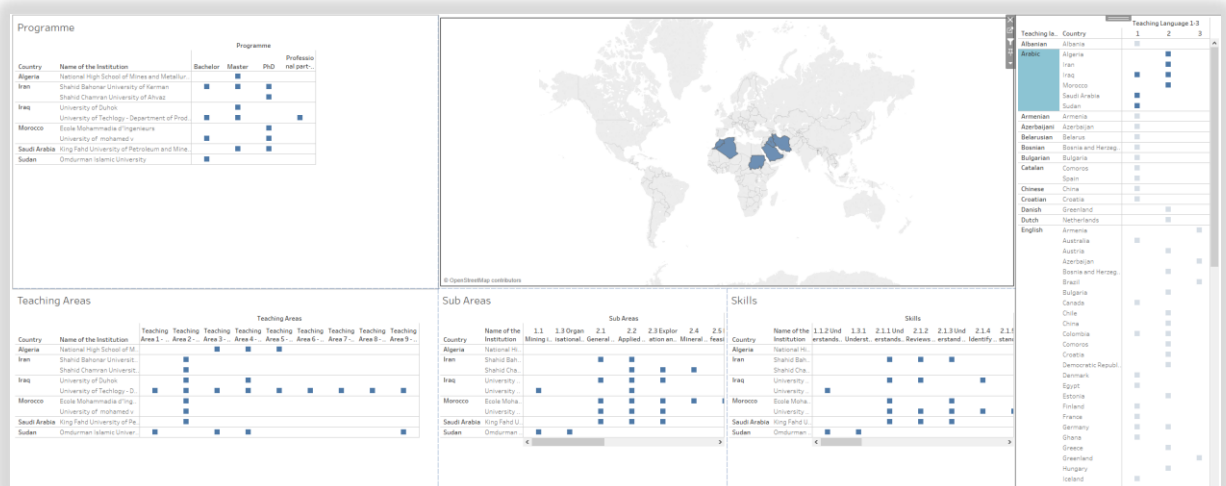


Figure 2: Example of displaying all programmes in Arabic language.

The proposal specifies the content of this database and interface. Due to practical reasons when performing the survey not all of the points could be filled. Mainly, we ranked the contents based on their importance for the project and balanced the effort it would take for the provider of the data with the available time frame. We wanted to keep the survey as short as possible, so that people would not lose their interest in providing the data, but as conclusive as possible, so that

we can perform the tasks promised in the proospal. These types of dat have been promised / provided:

Information	Status
Geographical information	YES
Strengths and Weaknesses of programmes	Not possible.
Protagonists	YES, but not publically disclosed due to concerns about privacy. Data mainly available for quality control and feedback.
Language(s)	YES
Conent and Overlap	YES
Number of participants	Was not collected. Effort was not in balance with importance for project
Target audience	YES
Duration and Workload	Was not collected. Effort was not in balance with importance for project. Too many diffemet sub-categories.
Skills developed	YES
Nature of Classes	We asked for entire programmes and skills, not for spec. classes. Most programmes will have mix of practical and.theroretical classes.

Work in progress:

The WP officially ended in January 2019. We keep working on the deliverables and tasks until end of March beacsuse we would like to include the insights from the Madrid meeting that was organised in january

The survey (<https://intermin.limequery.com/324595?lang=en>) will remain open at least until September 2019. All relevant institutions which are not yet represented in the database still have time to interact and provide content as well as updates. In fact, we are still pushing hard to increase amount of repsonses to an even higher level.

The raw data of the survey results are available as a xlsx-file, either on the Intermin-Intranet, or upon personal request.

The results of the questionnaire and content of the database build the basis for further activities in subsequent workpackages of Intermin-Project.

2.2 WP 2 – RAW MATERIALS SECTOR SKILLS, GAPS AND NEEDS (GAPS)

WP2 started in July 2018 with a review of mining industry position papers with special focus to skills and professions from the employers' perspective. This allowed for a collection of relevant subjects, drivers of change and trends that are relevant for the short-term.

In parallel, a Focus Group format was chosen as an effective way of collecting qualitative judgement on a specific set of topics. This work ran from July to January with three online meetings and a final meeting held in Madrid on January 30. The work generated three short reports and a 'Manifesto' summarising expected changes and needs in terms of skills and competences for raw materials professionals in the next 10-15 years. The outputs are mostly related to social & communication and Industry 4.0 dimensions..

Finally, WP2 used the previously described work to design a Delphi survey with the aim to assess long-term aspects (2050) that could require substantial adaptation of raw materials training programmes. Selected experts assess anonymously a variety of statements about the future in two rounds. For that, 4 different thematic categories were defined (see Figure below).

- The systematic comparison of Task 2.1 work with WP1 is establishing the basis for developing a Competency Model for raw materials professions. Future needs will be assessed against a backdrop of different social and economic hypotheses through Scenario Planning.

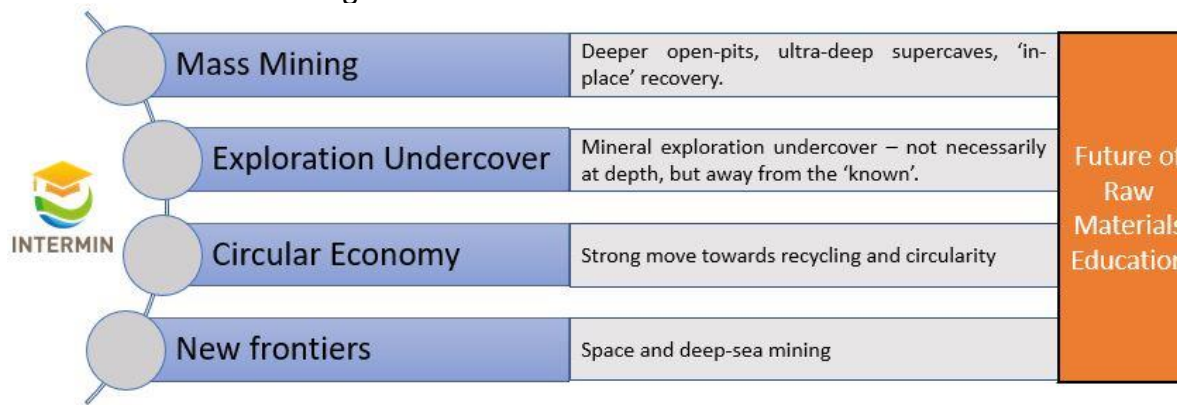


Figure 3: Fields of activity and knowledge addressed by the Delphi survey

2.3 WP 3 – TOWARDS ENHANCED TRAINING PROGRAMS (RESPONSE)

The WP 3 started in month 10 (November 2018). It aims to accelerate the adaptation of existing training programmes and the development of new training modules addressing immediate and emerging industry needs. To advance the alignment of training agendas and curricula worldwide it is necessary to compare training processes and training outcomes, thus establishing common reference points for quality assurance and related recognition of teaching and training.

In the reporting period the EFG made an extensive desk research on qualifications frameworks (at the international and European levels), and drafted the Deliverable 3.1, International Qualification Framework For the Raw Materials Sector. This deliverable defines areas of activity and key competences of the mineral raw materials sector, and advances a sectoral qualification framework for the raw materials sector (SQF-RM – see image below), that can be used at the global level. It also includes level descriptors of qualifications, and governance and quality assurance measures. This deliverable is now being revised by the INTERMIN Consortium, and will be completed by the end of May.

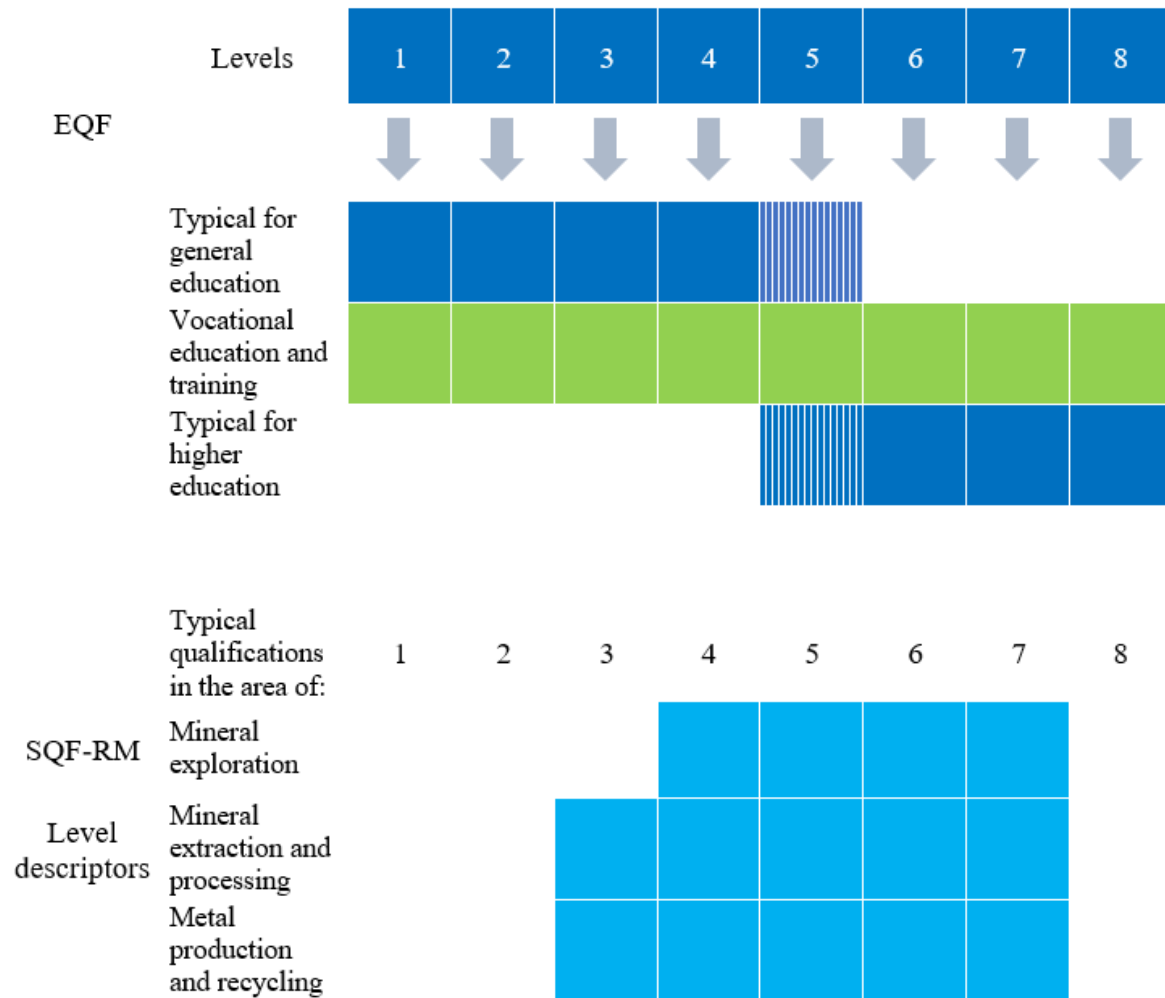


Figure 4: Architecture proposed for the SQF-RM, considering the qualification levels defined by the European Qualifications Framework (EQF).

IGME submitted an amendment including the German Professional Association of Geoscientists BDG as EGS 3rd party

2.4 WP4 DEVELOPING AN INTERNATIONAL NETWORK OF TRAINING CENTRES (LEVERAGE)

WP 4 started in January 2019. UPM is working in a parallel way in both tasks T4.1 « Mission design and positioning » and T4.2 « Creating and implementing the Network infrastructure ».

This WP will define the scope, create the agenda and investigate sustainability options for the long-term operation of a network dedicated to international cooperation and knowledge sharing by raw materials training centers.

The Network will capitalize on the work made in the other work packages (especially WP1, WP2 and WP3) to improve the framework conditions and competitiveness of raw materials training and education in the EU and globally.

The aim is to tackle longer-term challenges (as identified under WP2.1.2 and 2.1.3) by means of continued international cooperation and materializing a feasible, long-lasting international network of technical and vocational training centers for raw materials' professionals. This will require the definition of a clear mission, statutes, supporting infrastructure and procedures.

This WP has no relevant achievements to report due to the early stages of its activities.

2.5 WP5 – COMMUNICATION AND DISSEMINATION (EXPLOITATION)

- INTERMIN has been active and present in various cluster events and meetings: The list of events are as follows,

<u>EIT Raw Materials Summit</u>	May 2019	Berlin, Germany
Mineral Resources Expert Group Meeting	May 2019	Trondheim, Norway
<u>EGU – European Geosciences Union General Assembly 2019</u>	April 2019	Vienna, Austria
<u>PDAC – Prospectors & Developers Association of Canada</u>	March 2019	Toronto, Canada
<u>Raw Materials and Environment 2019</u>	February 2019	Berlin, Germany
ASOMM+3	November 2018	Manila, Philippines
Mineral Resources of Jurassic Rock	October 2018	Bangkok, Thailand
EGS General Assembly – 44th General Meeting and Directors workshop	October 2018	Bratislava, Slovakia
GEOSEA 2018	October 2018	Hanoi, Vietnam
3rd CCOP Gsi International Workshop	September 2018	Langkawi, Malaysia

2018 China-ASEAN Mining Cooperation Forum & Exhibition	August 2018	Guangdong, China
The 2nd Workshop of CCOP/ASEAN Integrated Geoscience Data Processing and Geophysical Compilation (IGDP)	July 2018	Guangzhou, China
GSJ International Training Course on Practical Geological Survey Techniques 2018 – application to geological disaster mitigation	July 2018	Tsukuba, Japan
World Bank Mineral Exploration Seminar	June 2018	Vientiane, Laos
Resources for Future Generations RFG2018	June 2018	Vancouver, Canada
Social acceptance workshop	June 2018	Brussels, Belgium
METS 2018- EU-LA Mining and Exploration Convention	April 2018	Madrid, Spain
EGS Minerals Resources Expert Group meeting	April 2018	Budapest, Hungary
EGU – European Geosciences Union General Assembly 2018	April 2018	Vienna, Austria
2nd Stakeholders’ Meeting of REMIX (Smart and green Mining Regions of EU) project	March 2018	Athens, Greece

INTERMIN is active on social media platforms: Facebook, Twitter, LinkedIn, Flickr and YouTube. The social media platforms have been witnessing a constant rise in the numbers of followers. Here are the number of followers:

- ✓ LinkedIn: 830+
- ✓ Twitter: 130+
- ✓ Facebook: 60+

- All communications materials are produced and were designed based on visual identity. Two brochures, a postcard and a poster have been produced so far, the materials were distributed

in all the meetings and were also published on the website and social media platforms. The produced materials are,



Figure 5: Brochure 1- Presents an overview of the project and its objectives.

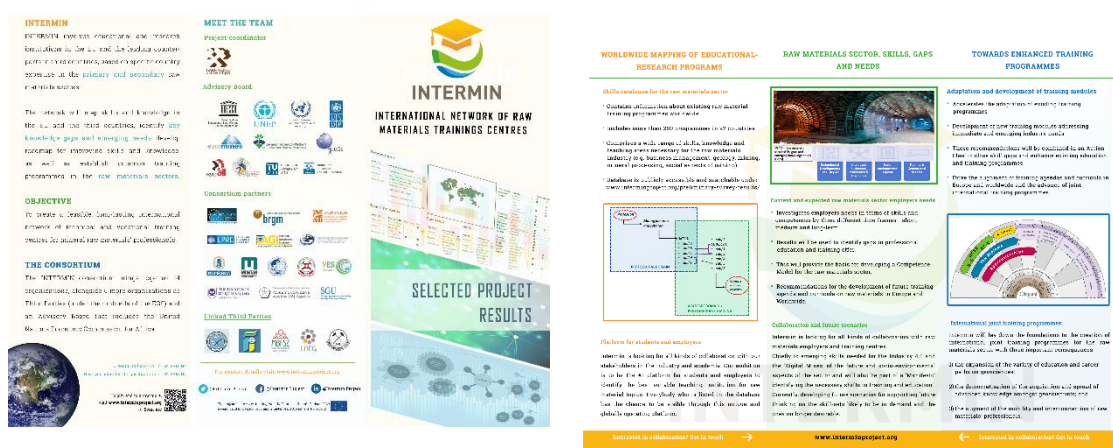


Figure 6: Brochure 2- Contains a general introduction to the project, meet the team and project results.



Is your training center in INTERMIN?

If not then,
Do not miss the opportunity to promote yourself
and to attract new networks of contacts

**INTERNATIONAL NETWORK OF RAW
MATERIALS TRAININGS CENTRES**

Have you submitted the questionnaire of INTERMIN?
visit
interminproject.org
for further details

To join and to know more, scan me

INTERMIN: The global online educational platform in raw materials will create a self-sustainable long-term lasting international network of training centres for professionals.

THE CONSORTIUM: The INTERMIN consortium brings together 14 organizations, alongside 5 more organizations as Third Parties (under the umbrella of the EGS) and an Advisory Board that includes the United Nations Economic Commission for Africa (UNECA)

MEET THE TEAM:

Project coordinator: 

Advisory Board: 

Consortium Partners: 

Linked Third Parties: 

For contact details visit: www.interminproject.org

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The project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 775642

Figure 7: Postcard- presents the details of INTERMIN questionnaire and an overview of the project. The postcard was designed to involve more participants to submit the questionnaire.



**INTERNATIONAL NETWORK OF RAW
MATERIALS TRAININGS CENTRES**

KEY POINTS & GOALS

1. Develop common metrics and reference points for quality assurance and recognition of training
2. Develop a comprehensive competency model for employment across the primary and secondary raw materials sector
3. Introduce an international qualification framework for technical and vocational training programmes
4. Create a conceptual framework for the development of joint educational training programmes based on present and future requirements by employers
5. Create and launch a joint international training programme by a merger of competences and scope of existing training programmes
6. Optimize future interaction and collaboration in Europe and internationally with the help of the INTERMIN online educational platform

THE CONSORTIUM

The INTERMIN consortium brings together 14 organizations, alongside 5 more organizations as Third Parties (under the umbrella of the EGS) and an Advisory Board that includes the United Nations Economic Commission for Africa (UNECA)

THE PROJECT

Will signpost critical disconnects between available education and employers' needs, and will advance short and medium-term actions to close current skills' gaps and enhance existing education and training at the international level.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 775642

Figure 8: Poster- The poster was presented at Raw Materials Week 2018, MIN-Guide EU and MIREU Conference

- The team is analysing the most relevant congresses and meetings to attend from June 2019. Other projects and universities had approached, and information's were exchanged. For example, MINETRAIN, social skills in MIREU and collaboration with the University of Jos, Nigeria, Africa regarding the filling of INTERMIN questionnaire.

Results achieved in the last 15 months:

- The INTERMIN team was very active during the EU Raw Materials Week, MIN-Guide, METS, PDAC and EGU networking, poster session and searching for a collaborator for the database and skills catalogue questionnaire and training centres updating.
- The webpage has been improved and updated adding new possibilities:
 - Library section – with appropriate documents related to the interests of INTERMIN audiences.
 - News section – with updates provided by the partners and to the interest of the audiences.
 - Presentations – relevant presentations are now made available for the general public under presentations section on the newsroom.

The Skills catalogue available online: friendly format and translated into Spanish to keep the interest of the Latin American countries. Deliverable 5.2 Hub and spoke website was launched and submitted²

2.6 WP 6 PROJECT MANAGEMENT

• Monthly conference

The coordination of the project, partners and tasks have developed without relevant incidents. The communication strategy among partners using the monthly conference call (go to meeting) is a useful tool and keep tracking issues and doubts regarding the project

² www.interminproject.org

IGME organizes a monthly coordinating conference call (using go-to-meeting platform) to track the actions and issues of each WP, as well as to compile ideas from the partners. Up to now 11 virtual conferences have been organised, some of them inviting the Advisory Board.

We are currently organising the agenda for the meeting in South America. It will be held in Guayaquil, Ecuador at the Escuela Superior Politécnica del Litoral from 21st to 25th October. The meeting will include 2 field trips, one to a artisanal small scale gold mine and to a boog international project. The conference will focus on the skills needed in this part of the works, to Sociela License to operate and Raw Materials supply in the National Park of Galapagos

We have changed the Poland meeting (2020) from Warsaw to Cracow, at suggestion of our Polish partners.

- **Madrid meeting 2019: “validating the skills catalogue”**

- ✓ **Opening and Introduction**

The internal meeting of the INTERMIN project took place in Madrd, at IGME’s headquarters on January 30 and 31, 2019. The main objective of the meeting was to analyse the project's status after one year of development. Also it was crucial to validate the draft skills catalog as well as closing and concluding the first part of WP2 works in relation with the gaps between the current existing education and training and employers.

The meeting started at 14:00 hours after a welcome finger food and registration. In total 33 people signed up including the members of the consortium, 3rd parties and advisory board as well as some external guests.

During the opening session, on Wednesday 30th *Manuel Regueiro* from the Geological Survey of Spain (coordinating team) introduced the agenda of the meeting and explained briefly the aims and current situation of the project³.

³ See presentation: http://interminproject.org/wp-content/uploads/WP6_IGME.pdf



Figure 9: Intermin Annual meeting in Madrid. IGME headquarters (photo courtesy Meng Wang)

✓ **Development of the meeting. conferences and topics addressed**

*Philipp Harlieb (Montanuniversitat Leoben)*⁴ explained the current status on the work package WP1 (World wide mapping of educational and research programs. Atlases) and the produced questionnaire. He requested more activity from the consortium network to complete the survey.

⁴ http://interminproject.org/wp-content/uploads/WP1_MUL.pdf

ASGMI will fill the information from the missing countries under its umbrella.. Some of the main findings of this stage were:

- Half of the replies to the questionnaire were from external people to the institutions.
- 310 started to the questionnaire, 171 partially completed it, 139 fully completed and 107 did not finish it.
- We have information and replies from almost all the countries in the world, however from some relevant mining countries we have only one single reply.
- The next deliverables will be submitted with one month delay (we have informed to the Projec Officer who has agreed) in order to include the results of this meeting:
 - o D1.2: Database process manual
 - o D1.3: Repository of training programmes
- We discussed that the context of the database should be increased in number of entities filling the questionnaire.
- The long term handling of the database.
- Repetition and improvement of survey

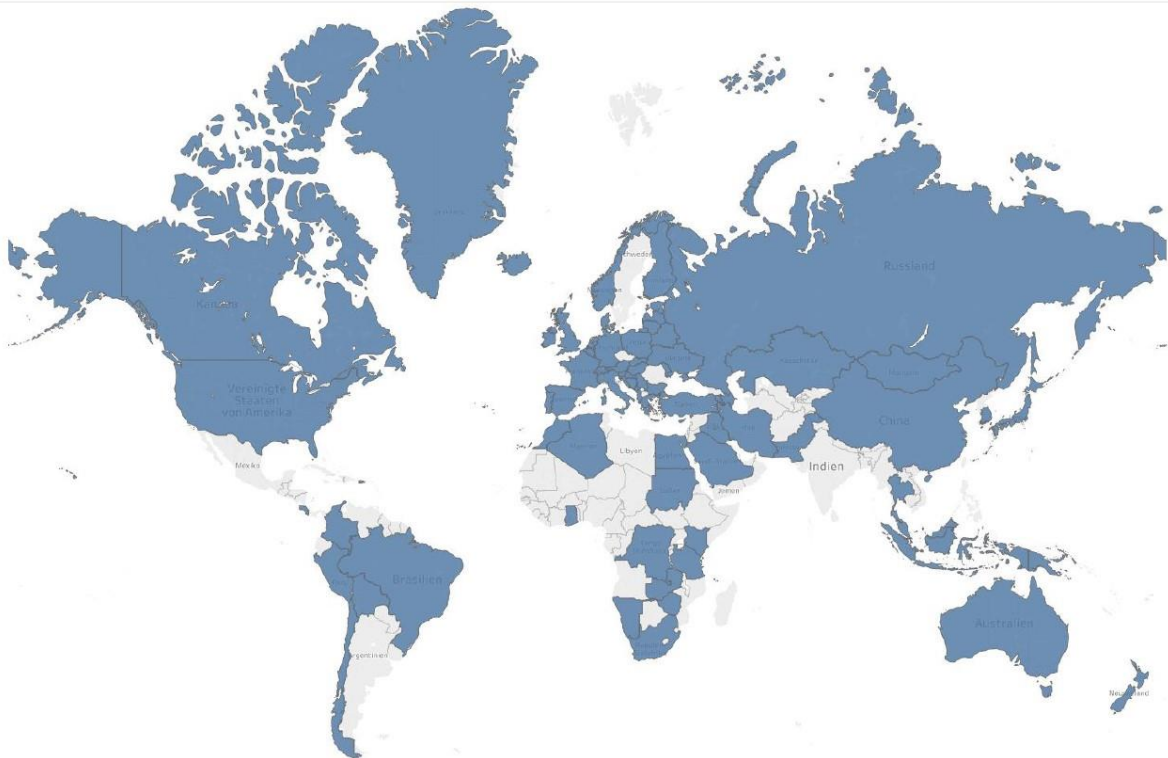


Figure 10: : world coverage of the questionnaire

Dhiti Tulyatid explain the current activities of the *Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP)*⁵ and the mining situation of the region – with strong link with WP1. Dhiti in his presentation comments that there are 60 centers in CCOP. He highlighted some figures regarding countries basic information and number of Universities that provide geology and mining engineering courses and programs. Dhiti indicated that mining activities are still active and important in E and SE Asia region. Each country has unique geological settings with different commodities. In general, most universities keep providing the same or similar basic geology courses. Some may add new subjects to the programmes as elective subjects in response to the need of the students/ communities. Dhiti pointed out that graduates will never know what they will have to work on when they get into the work market, i.e. mining companies, government offices, etc. These works require different skills and knowledge. Dhiti summarizes in the way forward that basic geological courses are still needed and also students of different countries may have the same basic geological knowledge but still need different focuses on applied geological knowledge depending on their geological setting and mineral commodity. The appendix of Dhiti's presentation shows a summary on countries, number of universities that provide programmes on geology and mining engineering, and the year of establishment.

⁵ http://interminproject.org/wp-content/uploads/7_CCOP.pdf

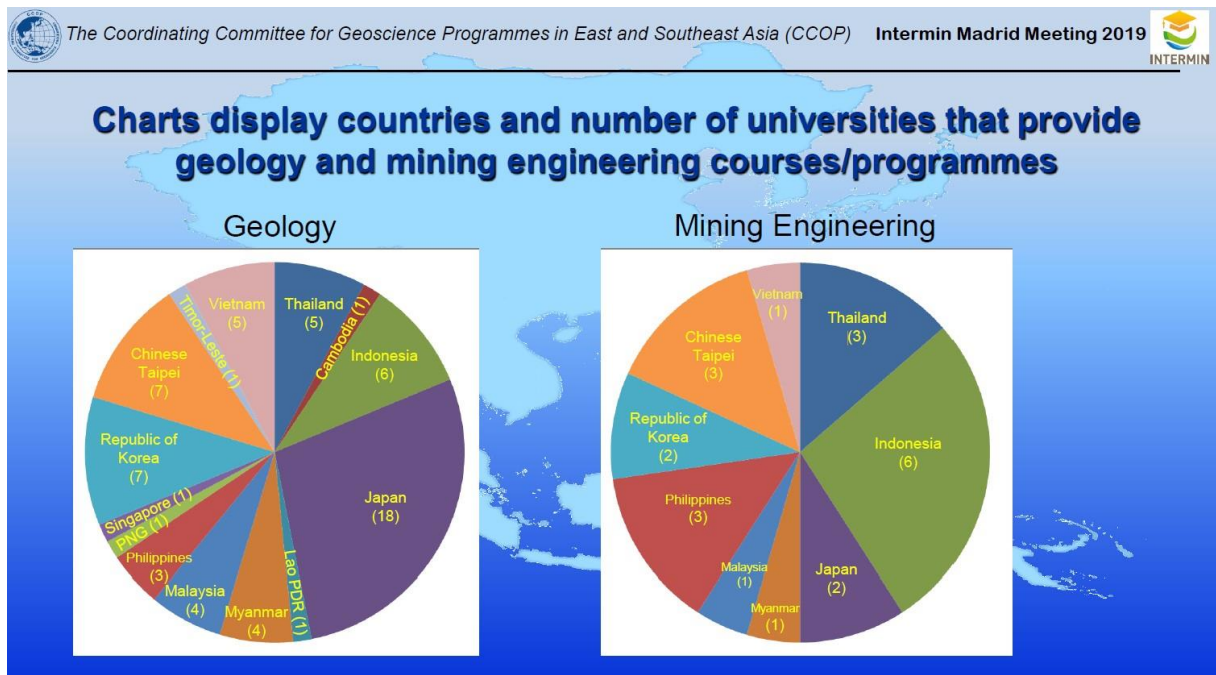


Figure 11: : COOP partners and number of universities that provide courses on geology and mining engineering

Marco Konrat (La Palma Research Centre) ⁶focused on the current status and future (new frontiers) of the WP2 “Raw Materials sector skills, gaps and needs”. He also explained the competency model for an scenario 5-15 years and beyond.

⁶ http://interminproject.org/wp-content/uploads/WP2_LPRC.pdf

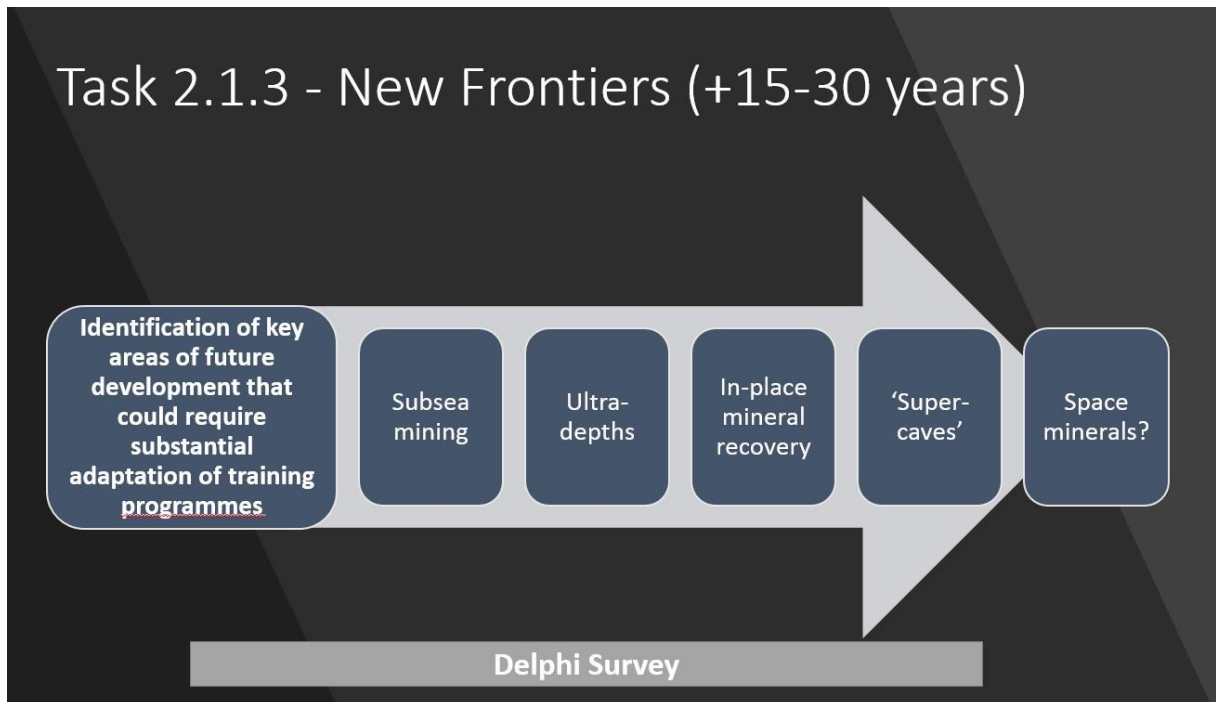


Figure 12: : New frontiers (+15-30 years) in Mining skills and activities⁷. Selected topics for the Delphi survey

Some of the remarks regarding future skills - addressed during the presentation were:

- Fewer workers on-site, more automation/ more remote operation centres - more competition in urban centres = workers with broad foundational skills + deep technical expertise in their occupation.
- Key challenges vary further depending on situation, geography, regulations and competitive environments.
- Competences of the future - 'Opposing forces': More technical, quantitative and IT literate jobs, while at the same time an increasing need of improving skills for dealing with social communication. For training providers this can be particularly challenging under different constraints of accreditation requirements and courses workload.
-

The Focus group is currently working on the "Manifesto" for shifts in training and education. Together with David Ovadia (external expert) they establish some final remarks of the focus group such as the recognition that the mining extractives sector is globally interconnected and

⁷ It is important to consider that some of the findings for the "New Frontiers" are aligned with other EU founded projects and activities of the commission. This outcomes reinforce the EU commitment in such activities. See for instance Deepsea mining in MINGUIDE Project or recovery of tailings initiatives.

increasingly dependent on multi and cross disciplinary skills and knowledge including, but not limited to, geosciences, engineering, robotics, environmental sciences, data management, social / political and economics.

The cluster session initially scheduled for the first day was moved to the second day. The only presentation that was shared was the EIT mineral briefcase, with participation of IGME⁸

Anne Lise Gautier (BRGM) analysed the beginning of the WP2 task “*develop a competency model for the raw materials sector*”. The WP presentation ended with a 2 hours working session on the future trends and drivers, guided by *Veronique Mablin (Futuribles)*⁹. The assistants were divided into 3 different groups. The outcomes will be the key drivers.



⁸ <https://www.youtube.com/watch?v=na9AxpAiY&t=3s>

⁹ http://interminproject.org/wp-content/uploads/WP2-Foresight_BRGM.pdf



Figure 13: Images from the working session

At the end of the workshop there was a very interesting discussion of different points of view about the skills required in the Raw materials mining industry in the coming years. Will machines or robots do the work of geologists? Maybe we need more knowledge on statistics or other non-conventional topics.

The second day Thursday 31 activities started at 8:30.

Luis Jordá (IGME WP6) moderated a quiz (using an online survey and QR code) whose aim was to validate the skills catalogue in accordance with the project proposal. A shorter version of the skills catalogue used for the WP1 questionnaire was elaborated in order to fill the quiz in less than 20 minutes. The catalogue was separated into 2 kind of skills: technical skills and “soft” skills, this last group included social and environmental aspects. Two sets of stickers were prepared in order to choose only one category. Attendants selected either one of the other:

The questions/responses according to the skills catalogue¹⁰ were the following:

Is the skill?

- Classical or consolidated skill
- Decreasing to deprecated skill
- Emerging skill or future needs identified
- Don't know

The quiz, already submitted online by each one during the event will be analysed in the coming weeks and will be included either in deliverables or online in the website.

The cluster session that was scheduled in the agenda for the previous day was developed at the beginning of the next morning. Each one of the speakers explained their project and indicated which are the main relationships with the skills covered in the Intermin Project.

- *Laurence Lamm*¹¹ highlighted the roadshow needs for lifelong learning. EIT is concerned about the skills needed for the Raw Materials sector.
- *Andrej (AGH)* presented the project MIREU in which they lead a WP that deals on skills for the mining sector and mining regions in EU.
- *Vitor Correia (EFG)* explained the project INFAC using a parallelism with the warships game. The project built 3 test sites for mining technology and for testing social and environmental impact.

*Krishnan Subramani (EGS)*¹² presented the communication and dissemination work package (WP5) of INTERMIN and their current activities. He indicated that we should try to publish some of the main outcome of this 1st year in a research journal. This will lead us to be more visible in the research gate portal: at least one paper will be ok. Luis and Philipp indicated that they were thinking about a peer review indexed journal, but that they debated and concluded

¹⁰ See: <http://interminproject.org/wp-content/uploads/Deliverable-1.1.pdf>

¹¹ http://interminproject.org/wp-content/uploads/8_EIT-RM.pdf

¹² http://interminproject.org/wp-content/uploads/WP5_EGS.pdf

that the first paper could be in a medium class editorial. Ulrich suggested he could collaborate with documentation.

Vitor Correia presented the WP3 “Towards enhanced training programs”¹³. This task aims to fill the existing gaps identified, and that the future training programs will meet the skills required by the industry and employer’s needs. It is important to develop reference points to compare programs and link to a short version of the skills catalogue and questionnaire. These reference points can be linked to CRIRSCO or UNFC codes and classification systems, also very linked to the new model of competent person that is being developed. Vitor highlighted that task 3.2 deals with emerging skills and needs (gaps).

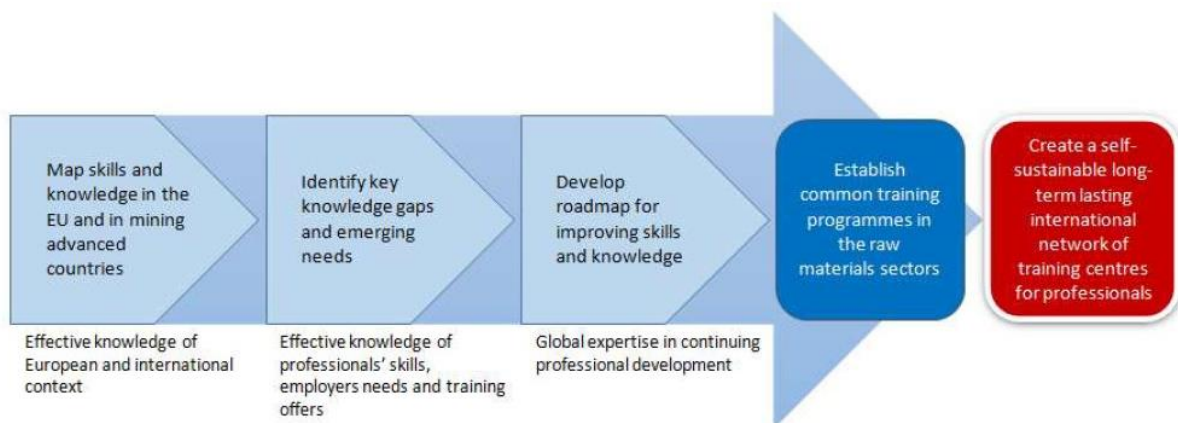


Figure 14: : Intermin workflow and the response concept

Isabel Fernandez (EFG) and Peter Muller (BDG)¹⁴ explained synergies with the BDG project and which ideas and findings could be shared with Intermin. The presentation of the BDG portal shows more or less what it is expected for the INTERMIN site and network, however it could help as guidelines for the search engine and layout. INTERMIN will not analyse university credits, as it refers to a world-wide search.

¹³ http://interminproject.org/wp-content/uploads/WP3_EFG.pdf

¹⁴ http://interminproject.org/wp-content/uploads/WP3_BDG.pdf



Browsing for discipline(s)



Figure 7: example of browsing for disciplines in the BDG portal for geosciences courses in Germany

*Javier Elorza (UPM)*¹⁵ indicated that the WP4 has just started. He explained the main ideas about developing an international network of training centres (leverage) and highlighted the resources available and which partners are involved.

There was an active discussion and technical debate on how to link different WP and platforms. Luis indicated that RMIS and auto sustainable networks could be very interesting for the future development of the portal and platforms.

✓ Meeting closure and main commitments from the meeting

In order to close the meeting we opened a debate about the future pathways and next steps in the project. The general discussion dealt with an overview of year 2. Peter Muller suggested that for next meetings it is important to clarify which are the goals and objectives. One of the

¹⁵ http://interminproject.org/wp-content/uploads/WP4_UPM.pdf

ideas that came out was that WP leaders will have the freedom to manage tasks and involve partners more effectively scheduling open conferences. These conferences can be back to back with the monthly conference calls. Chris Keane suggested the will be very useful to schedule the meetings ahead of time and indicate very clear which will be the topics to be addressed and the situation of deliverables.

Vitor Correia indicated that there should be an evolution in our communication strategy, now we talk about INTERMIN and we must shift to talk about INTERMIN outcomes. David Ovadia suggested to start now with the business model for the future. Francisco Elorza pointed out that in parallel with the training centres catalogue we could prepare a list of internships for students.

One of the commitments for a very short term was to schedule an IT meeting with WP1, WP4 and WP5.

Luis Jordá emphasized that once we have submitted the coming deliverables and discussion about the skills validation, we will have to start working on the final product of our project. For this purpose we must start with a shorter version of the skills catalogue and develop somehow a user friendly platform with a rapid view of the data inputs and training centres uploaded.



Figure 15: The meeting finished with a technical visit to the training mine of the Madrid School of mines (courtesy Meng Wang)