

Together for attractive mining work!

A roadmap based on knowledge of how mining work is developing and affected by changes such as digitalisation, new skills, increased safety and more gender equality.

Lena Abrahamsson

Professor Human Work Science

Luleå University of Technology

971 87 Luleå, Sweden

+46 70 359 21 07

lena.abrahamsson@ltu.se

<https://www.ltu.se/personal//lena-abrahamsson>

www.ltu.se/arbetsvetenskap



Researching the mining work of the future

“GreenDig”

A study of how **automation** changes **mining work** and **skills** demands and how a **learning organisation** in a green and digitalised mine could look like.

“GenSafe”

A study of the relationship between **gender equality** and **safety in the workplace culture** and look for methods that stimulate a safe and inclusive mining culture **throughout the supply chain – and the whole workplace.**

Roadmap for attractive, inclusive and safe mining work (“Attract”).

A research project (2022–2025) at Human Work Science at Luleå University of Technology financed by the strategic innovation program *Swedish Mining Innovation* (a joint venture by the national research funds Vinnova, Formas and the Swedish Energy Agency).



The project in brief.

The project run March 2022 – March 2025 (3 years).

The roadmap is developed by researchers (LTU) and company representatives (LKAB, Boliden, BDX).

We are doing this **together**.

By combining:

- **theories and previous research**
- **practical industry experience**
- and
- **new research results (from the project).**

One important method: **the project conferences**.



TILLSAMMANS FÖR ETT ATTRAKTIVT GRUVARBETE EN FÄRDPLAN



JÄMSTÄLLD
KOMPETENSSTRATEGI

FYRA HÖRNSTENAR FÖR
ATTRAKTIVA ARBETEN

GRÄNSÖVERSKRIDANDE
SAMVERKAN ÄR NYCKELN



Results (1).

Automation (autonomous vehicles) changes the work of (some) operators.

- Safer work, more varied work, more personal responsibility.
- Unpredictable (dependent on technology), increased bureaucratization and locked/inflexible work.
- Less social, fewer natural meetings for participation, joint problem solving and learning.

The new technology increases the need for learning organisation (for mining workers).

- The old structure of groups, positions, professions, hierarchical levels hinders workplace learning.
- Need for better and more cooperation over organisational borders.

Collaboration between contracting companies (suppliers) and mining companies (clients) is a challenge.

- Unequal power relations – client-supplier – difficult to develop joint solutions.
- Green and digital transition not prioritized in the sales order.
- Gender equality? Skills? Learning organization? Joint SAM? Safety culture?
- The contractors work in double systems (their own and the client's), perhaps several different industries.
- Lack of a strategy for digital collaboration.



Results (2).

Safety processes are well established and work, but there are exceptions – When things malfunction. When it comes to the others. When there is no time.

- Resistance to “safety first” (checklists and rules) is about the fact that there are still many physical risks and work environmental problems that need to be addressed.
- The macho culture’s resistance to safety is not dominant today.
- It is about the conditions for the miners to work safely.
- Different terms and conditions for working safely in the contracting company and contracting companies.

Workplace culture and inclusion is about all professions, positions and companies at the workplace.

- There are inclusion processes that exclude others. The opportunity to fit in is about gender, interests and origins.
- The norms of the local workplace culture are about being a man and a woman in the "right way". To be included, various forms of adaptations are required (e.g. tolerating "jokes") that risk counteracting safety and inclusion.
- It is different for different occupational groups.
- Safety has been more clearly integrated into the ordinary production processes than gender equality – both within each company and in the collaboration between supplier and client.
- One way to promote a safer and inclusive mining culture can therefore be to strengthen the gender equality perspective in existing safety work.

One important method: the project conferences.

At each project conference, participants from the four project partners (LTU, LKAB, Boliden, BDX) participated to discuss the results achieved so far.

- The first project conference (13 September 2022) focused on **existing company experiences and previous scientific theories** – *the needs and challenges*.
- The second project conference (19-20 September 2023) focused on **empirical results from the case studies** of Boliden (mostly Aitik) and LKAB (Svappavaara) – *validation, synchronisation, inter-company learning*.
- The third project conference (3-4 October 2024) focused on **research results** – and *starting of our work with the roadmap*.

During the project conferences we jointly developed an understanding of how existing and new knowledge and methods can be used in companies (both mining companies and contracting companies) to promote attractive, inclusive and safe mining workplaces.

2022 Aitik



2023 Svappavaara



2024 Luleå



Conclusions.

An important conclusion from the project is that the mining sector and its actors need to work together in new cross-border constellations, within and between companies and with the surrounding community, to make the mining industry and mining safer and more developing, inclusive and sustainable.

At the same time, we note that there is a need for continued research and development that refines and nuances knowledge about mining and its importance for the sustainable, green and digital transition.

The project's results will support the sustainable development of the Swedish mining sector. Knowledge and methods that put people at the center of the development of both technology and organizations are important pieces of the puzzle to meet the challenges arising from the green and digital transformation of the Swedish mining sector and sustainable development in local communities. This includes using gender and diversity theories as tools to design workplaces, organisations and societies.



Mining innovation for a sustainable future