

#MakingMiningMatter



Reimagining Training in Mining

A call for Submissions

An open innovation showcase to identify high potential educational innovations to be used for skills training and Zero Harm Production in the South African mining industry.

An initiative by Minerals Council South Africa and Harmony Gold, in partnership with RIIS.



INTRODUCTION

Building success stories

We are looking for training innovations that will enable miners to operate more safely, healthily, and productively, assisting in the journey towards Zero Harm Production. This can be achieved through knowledge transfer, skills development and increased understanding of principles for workers of all ages and experience levels. The innovations shortlisted for this showcase will go through a co-development stage to enable the application of their solution to the mining industry and showcase their solutions at a Demo day in September to senior decision makers in this space.

Partnering for People-Centric Modernisation

The Minerals Council South Africa and its partners, the Mandela Mining Precinct and the Research Institute for Innovation and Sustainability (RIIS), have dramatically shifted the visibility of innovation in mining in South Africa and aims to continue making progress in the arena, with projects such as this one. The Minerals Council has also partnered with one of its member companies, Harmony Gold, to identify and put in practice impactful solutions in the training space.



The Minerals Council's vision is to reposition the South African mining sector as South Africa's foremost industrial sector. The Minerals Council seeks to create, in partnership with key stakeholders, a conducive policy, legislative and operating environment that facilitates doubling real investment in mining by 2030. Its core purpose is to #MakeMiningMatter.

Harmony, a gold and copper mining and exploration company, operates in South Africa and Papua New Guinea, one of the world's premier new gold-copper regions. With 70 years in the industry, Harmony is an experienced emerging market gold miner and the largest gold producer in South Africa.

RIIS is a boutique strategy consulting firm focused on innovation ecosystem development across Africa. RIIS has delivered over 100 innovation interventions with organisations across the world focusing on empowering clients through corporate strategy, socio-economic development, and entrepreneurship and innovation.

WHY DO MINES NEED INNOVATION IN TRAINING?

Modernisation is a strategic priority for the Minerals Council and its partners, as it is an imperative for the mining industry's growth and ability to contribute positively to society.

The year 2020 showed that innovation and technology are vital to all industries as they seek to adapt to rapid change. The last year has seen intense focus on how innovation and technology can be used to serve and save humanity. In the face of unprecedented risk, every individual and organisation has been compelled to evaluate and change traditional ways of living and working. COVID-19 slowed the world down, but it accelerated change and the way industries react.

'Ten insights into 4IR in Mining', a report compiled by PwC in partnership with the Minerals Council and with the assistance of the Mandela Mining Precinct, identified that South African mining companies are, by their very nature, innovative, but there is significant room for the industry to embrace the fourth industrial revolution (4IR) and innovation more readily. Key takeaways included the big role that technology innovation can have in the areas of Learning and Development for a more empowered workforce.

Safety, Health and Environment are expected to benefit from the integration of Fourth Industrial Revolution (4IR) technologies.

As part of its [Khumbul'ekhaya](#) initiative on health and safety, the [CEO Zero Harm Forum](#) within the Minerals Council has identified the key role that training across the whole value chain plays in embedding Safe and Healthy practices and has supported the Minerals Council's efforts to identify the best training solutions to enable these. 4IR tools are expected to deliver improved employee engagement and training to embed Health and Safety practices in every day working processes.

Organisations must prepare their workers to overcome the digital divide

Companies are already exploring new working practices to bring everyone into the digital era. Key interventions for this include (1) creating learning groups that team up digitally proficient staff with those less digital-savvy to raise the digital know-how across the organization, and (2) conscious investment into training staff for digital transformation.

PURPOSE

Reimagining Training in Mining Showcase aims to address this gap

With this call for training innovations applicable in mining, we hope to identify new training technologies and methodologies that improve the absorption of knowledge and skills linked to improved Zero Harm Production in mining employees.

The top identified technologies will be showcased to industry leaders in September 2021.

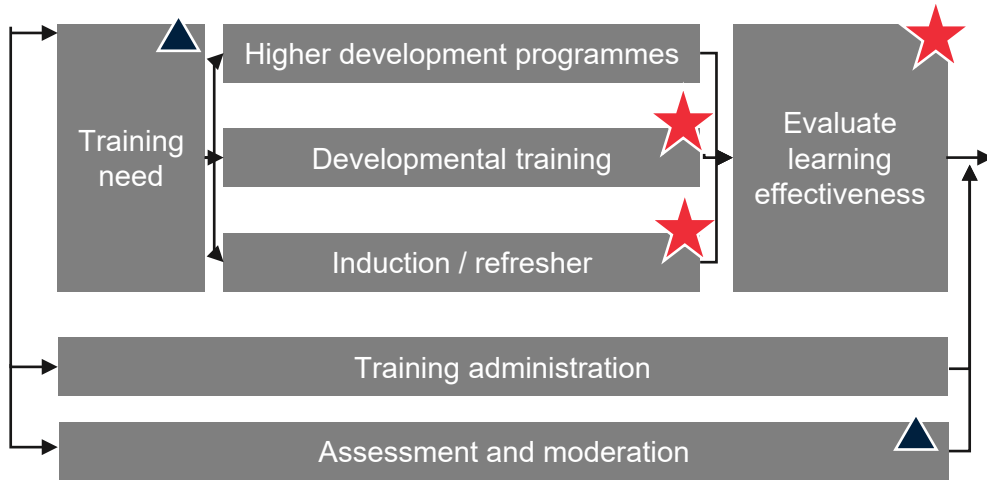


For the initial phase of this showcase, we are not focused on the content material, but rather the application and the potential the innovation has on positively impacting training within the mining industry. All training technologies focused on school education, soft skills such as empathy or emotional intelligence, or technical development in coding or science are encouraged to participate in this showcase, and, if selected, content will be adapted to the mining context in phase two.

CONTEXT OF YOUR SOLUTION

Your solutions will be applicable to the Harmony Gold workforce, which is outlined in the table to the right.

Harmony's Learning and Development value chain



Harmony Gold's Learning and Development framework is depicted above. It is important that the solution fits within this broader framework. Particular attention must be given to:

- ★ Solutions target these specific components
- ▲ Solutions consider / make provision for these specific components

Harmony Gold's Workforce Profile

	BABY BOOMER Age: (57 – 66)	GENERATION X (41-56)	MILLENNIAL (25-40)	GENERATION Z (<24)
Top management employees	3	16	1	0
Top management %	15%	20%	5%	0%
Senior management employees	21	88	19	0
Senior management %	16,41%	68,75%	14,84%	0%
Mid management employees	107	408	214	1
Mid management %	14,66%	55,89%	29,32%	0,14%
Junior management employees	633	3549	1798	22
Junior management %	10,54%	59,13%	29,96%	0,37%
Semi skilled employees	721	6283	4176	86
Semi skilled %	6.4%	55.77%	29.32%	0.14%
Literacy level below AET 3	309	2468	855	1
Unskilled total	741	7739	9859	379
Unskilled %	3.96%	41.35%	52.67%	2.02%
Literacy level below AET 3	409	3114	1382	22
Total employees	2226	18085	16068	488
Total employees %	6,04%	49,05%	43,58%	1,32%
Total employees below AET 3	718	5582	2237	23

- There are clear differences in learning preferences for each generation, and training processes must evolve with the times to cater to the needs of all employees.
- There is a need to upskills trainers, and ensure they are fit for people development.
- Any changes to training methodologies need to have the ability to adapt to changing needs.

TECHNICAL REQUIREMENTS

For phase one, your solution will not be assessed on the following requirements. However, these will become important if your solution is selected for phase two, where your solution will be shortlisted for potential integration into the existing Harmony training systems. It will count in your favour to indicate the possibilities of your solution against these criteria in your application.

CRITERIA	Y/N/Possible/ Answer
Platform Language (code) used and support: Is the system based on a platform that can be widely supported, should the service provider become unable to. Is the language used one that will have continual support going forward.	
Easy front end : Can the basic miner, with low literacy easily use and understand the system	
Ease of use for those with hearing or visual impairments : Does the system allow for voice prompts to cater for those that might have some vision or hearing imparity.	
Back-end (CMS –Content managed site) Management: Can the solution be managed and changed easily in-house. Can updates be done	
Accessibility : Windows / IOS / Android	
On-Site or Cloud : Is the service hosted on premise or on call.	
License system: Do we own the IP is the licenses perpetual or per user.	
Updates to trainings. : Does the system allow for refresher courses, automated or manual.	
Solution provider must comply with security reviews concerning the application and data security.	
Ability to maintain hours of operation for customer support and other customer-facing elements relevant to the solution /product	
Maximum user capacity outlined, and can manage	
Difficulty of Infrastructure Acquisition	
On Premise/Cloud/Hybrid Deployment Options	

CRITERIA	Y/N/Possible/ Answer
Typical software to service ratio?	
Customisations supported?	
Flexible licensing?	
Solutions, On premise, On demand and On device (Android, IOS, Web app)?	
Databases supported?	
Built-in real-time reporting?	
Average user base for your system?	
Multiple organisations functionality?	
Workflow approval for AP, AR, GL	
SOX compliant	
Ability to be customized? (Tech skills required?)	
Platform Language (code) used and support	
Additional hardware and software needed to support the product/solution.	
Level of effort needed to implement/provide the solution	

FOR THIS SHOWCASE **WE WANT TO SHOW**



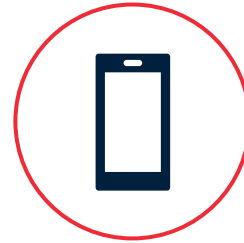
How might we use technology-enabled education innovations to reach Zero Harm production in mines?

Some examples include:



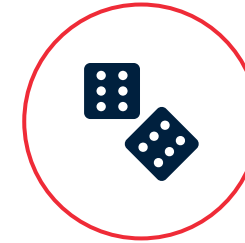
HUMAN CENTRED DESIGN

- Considering the needs of the intended learner at the core when designing the training / learning programme
- This allows for the training solution to be context specific and match much more accurately the needs of the learner



MICRO-LEARNING

- Taking small “bite-sized” learning content or information steadily fed through the right channel (e.g. mobile)
- Allows knowledge gaps to be filled in 3-5 minutes ‘lessons’
- Easily measurable impact of implementation based on tracking and testing the user in each micro-module



GAMIFICATION

- Using video game design and/or game elements in a learning environment to maximise the enjoyment and engagement of learners to solve problems and assimilate knowledge
- Content can be gamified with, for example, leaderboards and point systems to earn external prizes to engage learners in the process

APPLICABLE TECHNOLOGIES:

Mobile learning, E-learning, virtual reality, augmented reality, mixed reality. This is not an exhaustive list, and a solution with multiple technologies, or solutions focused on more than one of the above focus areas is applicable.

*Zero Harm production: To enable workers to operate in a workplace in a safe and healthy manner, while maintaining or optimising mining production.

END GOALS FOR THIS SHOWCASE



ENABLE COLLABORATION

We aim to enable collaboration between mining houses and EdTech specialists and suppliers to boost capacity and knowledge and enable cross-industry cooperation.



EMPOWER ENTREPRENEURS

Through this challenge, entrepreneurs and businesses who can solve the issues will gain access to market and have the opportunity to demo their solutions directly to potential clients.



PILOT NEW TECHNOLOGY IN MARKET

From this showcase, there is potential for a technology to be piloted within the mining industry, moving the needle in terms of training capabilities for the industry.



INCREASE SAFETY AND PRODUCTION ON MINES

By using the latest technology and learning methods, we bring the industry closer to zero harm production.

WHAT IS IN IT FOR YOU?



PRODUCT DEVELOPMENT SUPPORT

Innovations selected to take part in phase 2 and 3 of this programme will be supported financially with up to R10 000 to develop their showcase package to suit the mining context, along with co-development mentorship from RIIS.



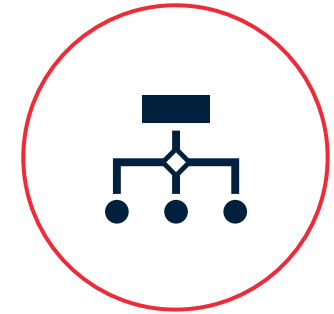
NETWORKING AND FREE MARKETING

If selected as a finalist, you will have the opportunity to showcase your technology publicly and receive significant brand exposure through project and media partners. This showcase aims to focus on community development, and enable collaboration in the South African context, of which your company will be part.



MARKET ACCESS

Finalists will showcase their solutions at a demo-day, helping provide access to key decision makers in the HR/L&D and technology sector, enabling market access and a free platform to market your solution to potential clients.



POTENTIAL FOR LARGE SCALE PILOT PROJECT

Should your solution be suitable to implement as a training initiative within Harmony, your product could be selected for the execution of a large-scale technology pilot, giving you long term market traction, and a business case to sell to other clients within the mining industry.

WHAT WE ARE **LOOKING FOR**

Technology Readiness Levels

- TRL 0: Idea.** Unproven concept, no testing has been performed.
- TRL 1: Basic research.** Principles postulated and observed but no experimental proof available.
- TRL 2: Technology formulation.** Concept and application have been formulated.
- TRL 3: Applied research.** First laboratory tests completed, proof of concept.
- TRL 4: Small scale prototype** built in a laboratory environment (“ugly” prototype).
- TRL 5: Large scale prototype** tested in intended environment.
- TRL 6: Prototype system** tested in intended environment close to expected performance.
- TRL 7: Demonstration system** operating in operational environment at pre-commercial scale.
- TRL 8: First of a kind commercial system.** Manufacturing issues solved.
- TRL 9: Full commercial application,** technology available for consumers.

Any products that enable knowledge sharing and capacity building through technology that are between TRL 5-9 will be considered, meaning that there must be proof of a product that has been tested in a learning environment, with an indication of the effect it can have on learning of the user. This can be shown as proof in skills development, feedback from the end users or supervisors/teachers, or an improvement of marks of the users.

Although solutions will be accepted from TRL 5, with a prototype tested in the market, preference will be given to solutions in TRL 7-9, where it is ready to be commercialised or implemented in an intended environment.

European Commission Standards (<https://businesscolumnist.files.wordpress.com/2014/10/trl-eu.jpg>)

TIMELINE OF THE PROGRAMME

**10am Monday
19 July**

Submissions for call for solutions close, and submissions will be shortlisted for phase one of the showcase.

Assessment focus:
Technology and quality of delivery of product/ service

**Phase 1
26 July – 8 August**

Semi- finalists will work with partners to create and test mining-specific training content with their solutions to assess the desirability of their solution on the mines.

Assessment focus:
Potential impact on mine, desirability for workers, and technological fit within the Harmony systems

**Phase 2
9 August – 20
September**

Finalists for the showcase selected and given the time and R10 000 to tailor their solution for the showcase event.

Support provided to finalists to progress technology and content to be fit-for-purpose at the showcase event, for maximum chance of sales or selection for pilot

**Showcase event
28 September 2021**

Finalists demonstrate their updated technologies with mining-specific content to key players within the South African mining industry.

Should value be seen in your solution, discussions will continue with Harmony and Minerals Council to design and implement a pilot project.

- All announcements will be made with enough time to accommodate for planning.
- Please note that for this challenge, no travel costs will be covered to attend the showcase event, set in Gauteng.
- Should you have any questions or queries, please do not hesitate to contact us at alana.kruger@riis.co.za

CRITERIA FOR JUDGING

CRITERIA	DESCRIPTION	1	2	3	4	5
Technology	Uses technology to educate and train	No technology applications	Limited technology applications	Fair technology applications	Excellent technology applications	Can revolutionise training with technology
Application of learning and cognitive principles	Applies learning and cognitive principles in a way which affects understanding, knowledge retention and motivation to learn positively	No insight into understanding OR no evidence of consideration	Limited consideration or application	Fair description of application of principles	Applies principles effectively	Exceeds expectations of application of principles
Clear target market description and design focus	Applicable to a target group of trainees in the mining industry, as outlined in the brief [based on age / skills level / company level of workers at Harmony]. Clear indication that solution is designed around their user needs.	No target market identified	Unclear target market	Target market identified but not motivated	Good motivation of target market	Clear method outlined to revolutionise training across multiple target markets
Proof of track record	Proof of market traction, previous projects and clients, and years of experience in industry	No track record in market shown	1-2 projects / clients in market described OR 1-3 years	3-5 projects / clients in market described OR 3-5 years	More than 5 projects / clients in market described OR 5-10 years	Over 10 projects implemented successfully described OR more than 10 years
Feasibility of solution	The solution is physically possible within its environment, with no additional R&D required to ensure the success of implementation	Not feasible	Has potential to be feasible	Feasible, with fair obstacles	Feasible, with minimal potential obstacles	Fully feasible as product currently is
Viability of solution	The solution can be used in a business model and can be profitable. Proposal must include a measurement of impact and cost effectiveness.	Not viable (clear financial loss)	Has potential to be viable	Can be viable with additional funding	Solution is financially sustainable	Solution demonstrates and quantifies a promising level of return on investment

CRITERIA FOR JUDGING

CRITERIA	DESCRIPTION	1	2	3	4	5
Team capability and intent	The team is passionate and dedicated to the solution; and can solve problems effectively	No passion or want to solve problems	Team has little interest/ capacity	Team has passion, but other priorities	Team has passion and few other priorities	Team is fully dedicated to solution
Sustainability of training content	Training content needs to be maintained and updated frequently. Client should be able to manage this.	Unable to maintain and update content	Able to maintain only certain parts depended on service provider	Able to maintain and update all content but depended on service provider	Client able to change content but depended on service provider to update	Client able to change and update content as required. Also have the option to use service provider.
E-learning package standard	E-Learning package standards and compatibility (LMS compatibility).	No Standard and not LMS compatible	Own standard used	Old standards used and LMS Compatible	SCORM 1,2 used and LMS Compatible	XAPI used and LMS compatible
Holistic training solution	Not only meeting specific requirements, for example only simulators (standalone applications). Should have the capability to host a whole training process or plug into a system that can.	Standalone application only meeting certain requirements	-	-	-	Holistic training solution able to host a whole training process
Training cycle followed	Was the training cycle followed when the solution was created. (Needs Analysis, Design, Training Delivery and Evaluation)	Not followed	Only one followed	Only two Followed	Three followed	The full training cycle has been followed

SUBMISSION INFORMATION

Send your submission to:

alana.kruger@riis.co.za

DEADLINE: 19 JULY 2021 10 AM

See the submission check list on page 15

For more information, go to:

<https://www.enablinginnovation.africa/reimagining-training-showcase>

For any questions/ queries, please email

alana.kruger@riis.co.za

SUBMISSION CHECKLIST

AREA	ITEM	NOTES
OVERVIEW	<ul style="list-style-type: none"> Lead applicant name Email address Phone number 	
	Company name	If private solution provider, name will suffice
	Website URL	
	Location – Area, city, province	Must be in South Africa
	Ownership / BEE status of company	
	Type of technology put forward	For example: VR headsets / AR application, etc.
	Stage of development	TRL level, page 10
	IP ownership of product	If applicable
	Target market for solution	Age, learning level, type of training (see slide 5).
SOLUTION	Description of your product / service	
	The problem / market gap your solution addresses	
	How it works	
	Learning principles applied or approach followed	
	Business model overview (revenue model)	
	Supporting hardware or software needed for development	
MARKET TRACTION	Track record of previous clients, sales, projects, or years of experience	
	Plans for scaling solution	
	Images, videos, links of your product in market	
TEAM	Names of team members	Management and implementation team
	Qualifications	
	Skill-sets and proficiencies	
	Related experience	

- Submissions must be in PDF format in the form of a pitch deck or business case and must meet the submissions requirements as outlined here – you are welcome to use this as a template as an alternative to a pitch deck.
- Please note, training content is not a requirement for this stage of the proposal, but quality of learning material and application of learning principles is important for the judges to understand.
- Any additional documents/ materials must be uploaded in pdf format.
- Final submission date **19 July 2021, 10 am**
- Check if your submission matches judging criteria. There will be a chance for you to score your submission yourself with the criteria given in the brief
- If you have any questions, email alana.kruger@riis.co.za.
- ENJOY the submission! 😊

DISCLAIMER INTELLECTUAL PROPERTY

The intention of this challenge is to identify promising technological innovations that could be implemented in the mining industry.

It is important that no confidential intellectual property or information is disclosed through this process. This may include pre-existing software, processes, systems or market research that is not publicly available.

By submitting a response, you represent that your response does not, and will not be deemed to, contain any confidential information of any kind whatsoever. Minerals Council South Africa, RIIS, Harmony and its project partners will not be held liable for the loss of any intellectual property.

In the event that your solution is selected, if required, a partner agreement will be signed to protect intellectual property.