



Africa's first virtual reality mine design centre

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With the establishment of the Virtual Reality (VR) Mine Design Centre at the University of Pretoria's Department of Mining Engineering, the mining industry in South Africa – particularly the training of new mining engineers – will enter a new era.

This is the first centre of its kind in Africa to be housed at a university (and only the second in the southern hemisphere) that provides safe training to students and mine staff on mine safety and other related issues in a simulated mining environment.

This centre was made possible by an R18.8 million sponsorship by Kumba Iron Ore over a period of three years. The company's investment in this groundbreaking form of education, research and development includes the development of open-pit mining-related software modules.

Kumba's VR Mine Design Centre will be able to realistically simulate a range of mining functions, from accident reconstruction and risk analysis, to responding to potential hazards and testing evacuation procedures – all in a low-risk, high-impact learning

environment. It consists of floor-to-ceiling screens, and the VR Simulator will cast 360° 3D images against the dark surrounding panels with cinematic clarity and highly realistic sound effects.

"The mandate from Kumba," says Prof Ronny Webber-Youngman, Head of the Department of Mining Engineering at the University of Pretoria, "was that the new facility had to be highly interactive." Its investment in cutting-edge 3D technology will allow students and staff in the mining industry to move around in a realistic virtual mining world, with an emphasis on surface mining as well.

The applications for a centre like this will transform the way in which mining engineers are currently educated and trained.

According to Prof Webber-Youngman, virtual reality centres in other parts of the world have been highly effective in improving mining productivity and mine design, and most importantly, protecting lives through improved health and safety awareness. “This new facility will take our students beyond the boundaries of traditional education and into experiential learning in a safe and forgiving virtual world,” he says. It is also in line with the University’s current strategy to enhance and increase its facilities to accommodate more engineering students.

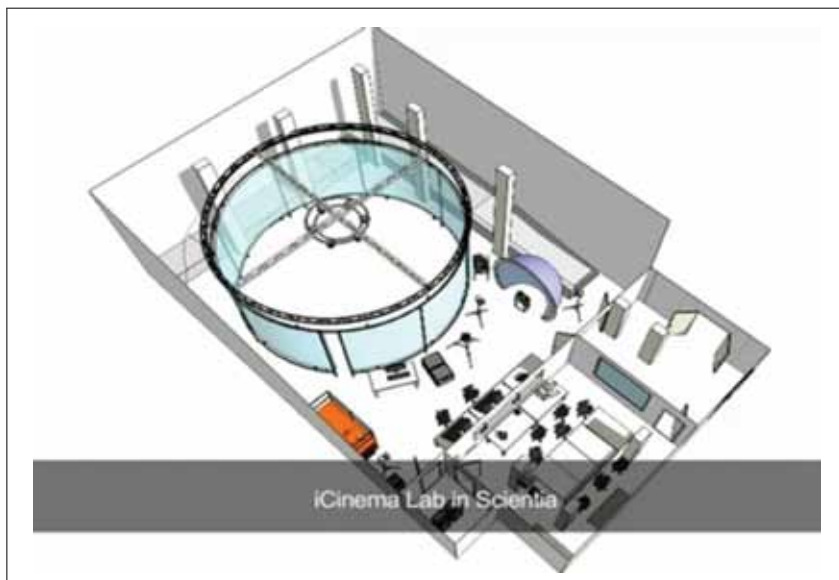
“The Kumba VR Mine Design Centre will simulate high-risk scenarios in a safe and controlled environment where the consequences of any unsafe acts can be powerfully demonstrated without causing any actual loss of life and damage to property,” says Prof Webber-Youngman.

Undergraduate mining students will be able to integrate different conceptual and software modelling techniques, which incorporate geological models, mineral extraction methods, mine planning and design, and mining systems in a VR environment.

Further benefits include the ability to virtually design a complex mining operation from the ground up. The customised design packages will allow trainees to build their understanding of complex mining operations throughout the mine’s life cycle, and show the visual and environmental consequences of their technical decisions.

“By improving the ability of mining engineers to take into account the long-term environmental consequences of their financial and technical decisions in a virtual environment, there will be significant economic, environmental and safety benefits to the industry and surrounding communities in the real world,” says Prof Webber-Youngman.

Virtual reality simulation products have been on the market for the past few years, but have recently



→ *iCinema Lab in Scientia, photo courtesy of Prof Bruce Hebblewhite, Head of the Department of Mining Engineering, University of New South Wales, Sydney, Australia.*



→ *The Kumba Virtual Reality Mine Design Centre will be able to realistically simulate a range of mining functions.*

undergone major improvements in quality and speed. By investing in the VR Mine Design Centre, Kumba is living out its belief that all injuries are preventable, and its commitment to making safety a way of life – both inside and outside the workplace.

Although there has been a downward trend in fatalities in South African mines in the last few years, a lot can still be done to achieve the ‘zero-harm’ objective that is embraced by mining companies. In addition to providing proactive safety

training, VR technology allows for the reconstruction of actual mining incidents for forensic investigation purposes to try and prevent the recurrence of such incidents in the future.

Such a centre therefore has great potential to contribute to achieving this objective, which will have a great impact not only on the activities of mining companies such as Kumba Iron Ore, but to the mining industry as a whole, especially in terms of mine planning and design. ●