Zero Harm starts with proper interactive education.

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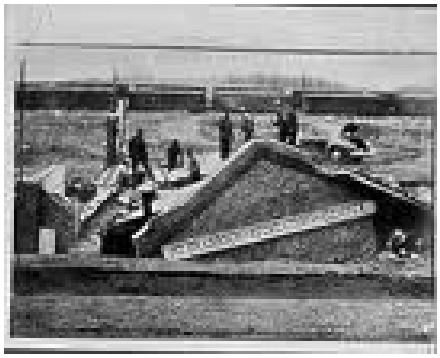
1. Introduction

Health and safety in the mining industry is of paramount importance, given the dangers that exist in performing mining and manufacturing work. Aside from the moral obligation towards workers to protect their health and safety, the mining legislation places an obligation on all participants in the industry to prevent exposure to unacceptable levels of risk.

2. Legislation

The legislation also outlines stringent requirements to ensure that workers are adequately skilled and trained in safety systems and are inducted before they commence work on site.



It is therefore imperative that inductions and ongoing training be designed to limit the chances of incidents arising. In a worst case scenario, such safety training programs and inductions may be called in aid, when;-

(a) Defending and apportioning responsibility of health and safety prosecutions; and/or
(b) Other statutory or civil claims.

3. Zero Harm – start with proper training.

The key word should be ‘zero-harm’, and this can only start right at the beginning of an interaction with a mining group, and that is with proper interactive education and training.

In short, effective induction and ongoing training play a key role in managing health and safety risks in the mining industry. With the visual display of real-

life situations, and the fact that students should constantly be required to INTERACT and PARTICIPATE, the learning process will be much more effective. Students learn for life because they EXPERIENCE real-life situations! Communication skills are being developed and the aim is that trainees should be changed into trainers.

4. Modern Training

Modern students are accustomed to modern technology, graphics and displays, and this should be incorporated into the training process. Unfortunately teachers and trainees are slow to change. It took us 50 years to change from a blackboard, to a green board, to a white board. The OHP was discovered in WWII and used for military training, but it was first used in schools almost 20 years later!

Furthermore, great numbers of teachers and trainers still depend on their own talking abilities. They are so impressed and inspired by their own 'talkative' presentations that they forget about the word 'training of students'. This is an 80 to 100 year old teaching practice.

In teaching and training, trainers should refrain from doing all the talking. Give the students the time to talk, and to report on what they have learnt. It's amazing, the more a trainer talks, the more equipped the trainer will become, instead of the trainee. Rather give the students the opportunity to reach this high level of communication and knowledge enrichment. That is, at the end of the day, the main purpose of training!

It has been said that unlike most knowledge industries, education is the only industry that hasn't kept up with our world of information technology. As an initial step in the right direction, many trainers implemented video training in the training centres. Video training typically features self-directed, self-paced and individualized learning. However, this learning approach soon led to new problems faced by both educators and students. The teacher is no longer in control of the teaching process and learning itself becomes autonomous. Students reportedly become bored, disorientated and become lost in information overload and as a result, they lose focus, concentration, lack goal-directed learning and problem-solving, and lack interpersonal skills and group directed learning.

We all know the importance and advantages of information technology and computer technology in particular. However, to be effectively implemented in Education, computer facilitated learning requires an appraisal of students' thought processing, teaching and learning paradigms and human interactive skills.

After years of research in the areas of Education Technology, and Neurology, as well as fieldwork in these areas, I have created a new, modern and effective teaching paradigm called Computer Instructional Learning or CIL. CIL facilitates teacher-driven education, focus and concentration, student-peer interaction and effective problem-solving and concept processing. These objectives are achieved due to the facilitation and unique features of the Interactive Touch Board, the key CIL teaching tool, from which CD-ROM

lesson knowledge emanates. This Touch Board is the focus point in the classroom. It creates an Information Environment (IE) where the Instructor is still in control of the training process, but with the added advantages of stimulating activities, illustrations and information at his/her fingertips. At the same time, students enjoy interacting with the images on the Touch Board as they touch, select, classify and colour information on the interactive screen. Furthermore, students are encouraged to interact with peers, to solve problems, do group work and to give reports. All of these create a fun-filled, classroom environment supportive not only of 21st Century information processing but also of effective knowledge processing.

5. Visual Perception

'All over knowledge has it's origins in our perceptions' or
'What we see is what we learn' Leonardo da Vinci.

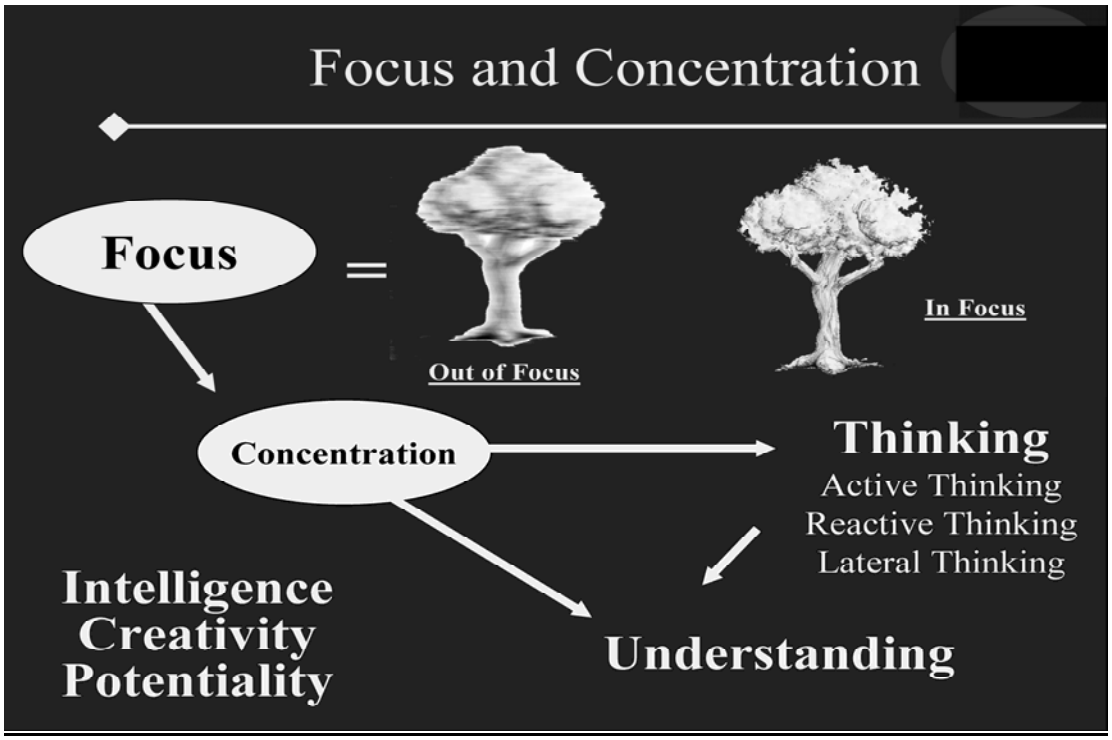
> 'What we see is what we learn.'
> Leonardo da Vinci

Two more quotes for modern training.

"The brain is the ultimate use-it-or-lose-it machine, and it is eager to learn new skills"
Ronald Kotulak

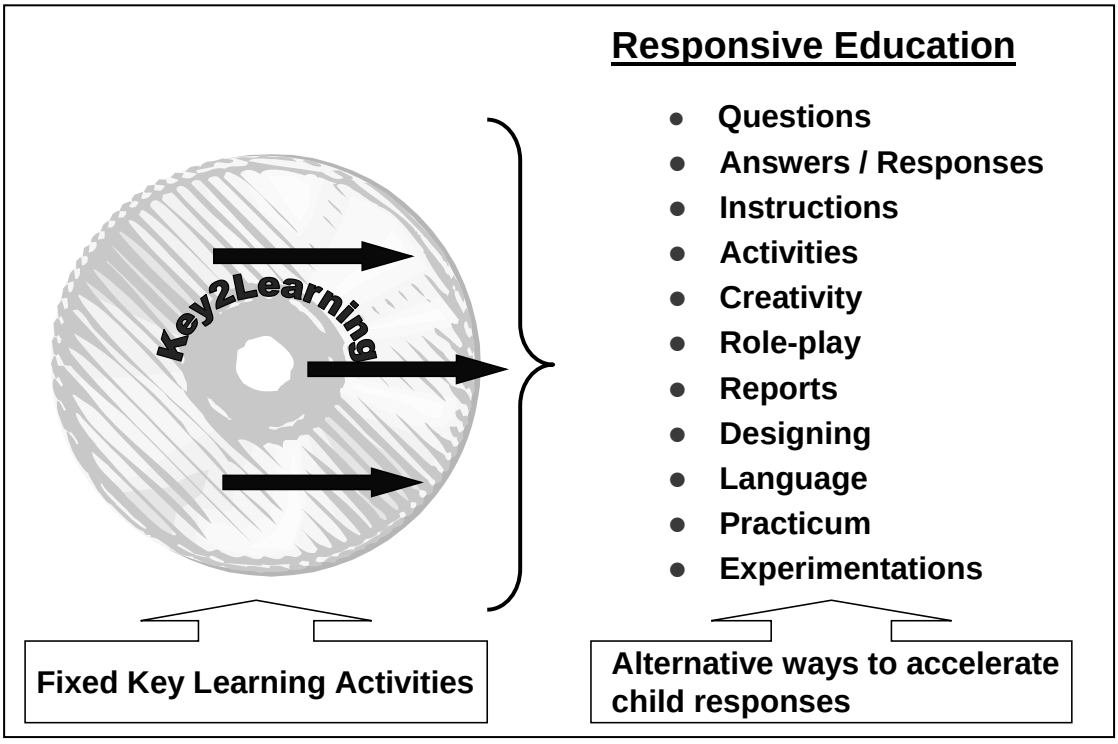
"We do waste a lot of brain power because we are not quite sure how to exploit our brains to the maximum."
Lawrence Garcy
University of London

6. Focus and Concentration



Teachers and trainers have witnessed first-hand the effectiveness of the Interactive Touch Board in grasping the students' attention and concentration – even children as young as three years-of age! This is due to the vast amount of visualization and auditory information projected onto the screen and the interactivity of the students with the Touch Board. It is as if students can 'step inside' worlds of learning (presented on the Touch Board). I can put it this way: 'Why can young children, as young as three, watch a 2 or even 3 hour long movie without getting bored or losing concentration and interest? However, once these kids are placed in the traditional classroom, they become placid, bored and their concentration goes out the door!' However, with the CIL concept and education software programs complementing the system, young students are actively participating and concentrating.

7. Responsive Education



In this modern teaching methodology, the learning environment has been structured to use an interactive Touch Board and specially designed software to dictate the learning process. The nature of the software is instructional, interactive and responsive.

The variety of images on the software stimulates student's interest and desire to learn. A series of visual images on the Touch Board are created to stimulate their thoughts, imagination and knowledge.

There is a bigger responsibility on the trainers to control student participation and learning quality.

In a study by Clariana (1997), it was suggested that learners displayed the following characteristics when they were exposed to interactive education.

- They were less passive and more active;
- Some normally reticent students came out of their shells and began to work.

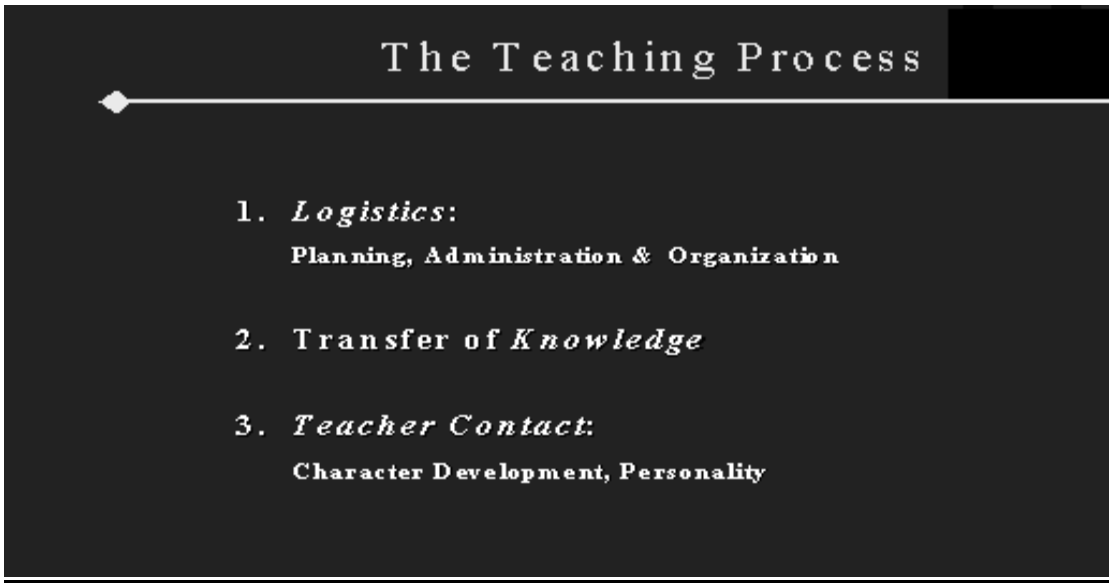
In Interactive Education, we have the further advantage that trainers can control the activities and responses of students, since the instructors have to focus on the student instead of the transfer process.

8. Key aspects of Interactive training

Key aspects in the training aspect should be:

- to expose students, through visual displays, to real-life learning situations;
- that students should interact and participate in the learning process;
- that students should experience real-life situations;
- to improve their focus, concentration and understanding of learning content;
- to expose them to knowledge and to learn how to apply this knowledge;
- to develop their communication skills (trainees should soon become trainers!);
- to change their attitude and awareness about health and safety issues –(better work practices; lowering risks; avoiding incidents and accidents; avoiding downtime);
- to present students with structured lessons filled with knowledge, and presented so that they will understand the context and enjoy the learning experience;
- to guide instructors with fully planned, comprehensive and structured lessons in order to ensure that the quality of training will always be on the highest possible level;
- the incorporation of practical sessions;
- to focus on evaluation and assessments.

9. The Teaching Process



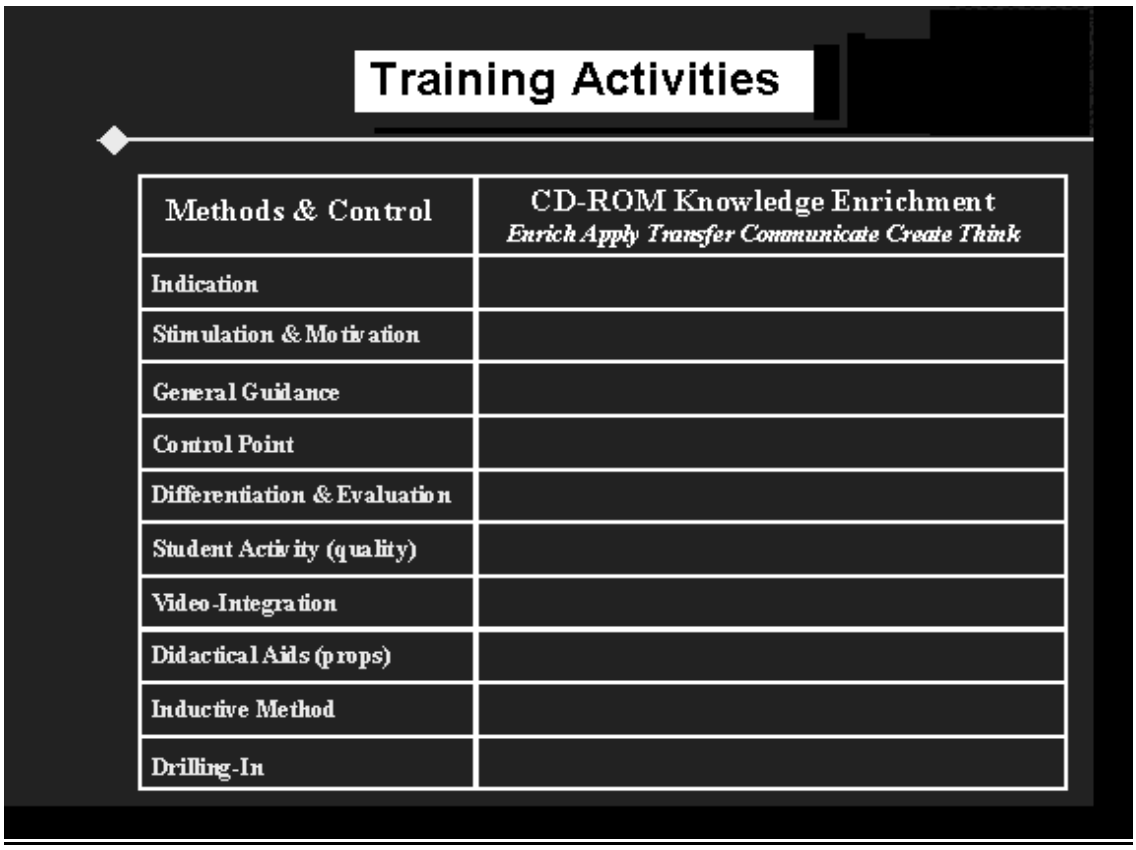
An important aspect of Interactive Training Programs is the increased ability of trainers to transfer knowledge successfully to their students in comparison with the performance of trainers in ordinary educational programs.

The level and intensity of knowledge transfer is also 4 to 6 times higher. The educational information is structured, classified and directed to read a preset goal. For a trainer in ordinary education to transfer the same amount of knowledge in conjunction with images, pictures, quality etc. it seems like an impossible task in comparison to what can be achieved with interactive software.

In ordinary education, trainers create an opportunity for students to 'learn by discovery'. In CAL it is removed, since students will have to respond correctly. In Interactive Education we even go further, since students are controlled and motivated by the trainers to respond correctly to the instructions of the computer.

The conclusion in regard to Interactive Education and CIL is that all the lessons are organized and structured, and the trainers do not have to search for material.
In Interactive education, the instructions come from the computer, but the control and motivation is student-centred in the sense that the instructors motivate and control the responses and performances of students.

10. Training Activities



11. Student Focused

Student-focused

- Develops focus, attention and concentration
- Development of communication skills
- Self-esteem & self-expression
- Creativity & imagination
- "Step inside" thousands of learning worlds
- Lifelong learning
- Visual & auditory perception
- Decision making
- Practical Hands-on sessions
- Allows constant interaction: responsive and interactive
- Evaluation
- Reinforce Outcomes
- Application of knowledge
- Develop THINKING: Active, reactive, Lateral, Critical

One of the great advantages of Interactive Education is that students receive the opportunity to apply their knowledge and skills by participating in reports, answering questions, interviews, role-plays, etc. Through an interactive and instructional method students are requested to present answers in complete sentences (language skills); to learn to reason (reasoning abilities); to imagine (creativity); and to think before they talk (creative thinking).

12. Research Results

China Sino – UK Research Project 2004-2006 (China, UK, Promethean World)
Beijing Capital Normal University
2900 Students in 700 classrooms, 64 teachers

- 88% of teachers agreed that the use of the Touch Board would improve the quality of Education;
- 94% of teachers said that the use of the Touch Board would improve the quality of Education;
- 94% of teachers said that the use of the Touch Board would lead to more efficient lesson preparation;
- 92% of teachers said that it improved the motivation of the students.
- 95% of teachers reported greatly increased levels of interaction between students and teachers;
- 83% of teachers said that it had improved the evaluation and assessment process;
- 94% of teachers said that the use of the Touch Board had allowed them to deepen students understanding of key topics in important areas of the curriculum;

- 95% of students have adopted easily to classroom teaching using the Touch Board;
- 92% of students stated that lessons had become more interesting than they were before.

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