

# Safety Training- How to make it work

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## Abstract

The author has over 25 years senior experience in the Occupational Health and Safety management and Occupational Health and Safety training fields and through a process of critical reflection has reached the conclusion that training can be a very effective intervention to achieve success in Occupational Health and Safety . The following paper assumes Occupational Health and Safety training can be effective in achieving Occupational Health and Safety change and concentrates on means of developing safety training that is efficient. . The reader is particularly directed towards the NIOSH study," *Assessing Occupational Health and Safety Training - a literature review*" by Cohen and Colligan for discussion on whether safety training is effective in achieving safety change. The answer according to this paper appears to be a resounding "yes".

## Discussion

*In (Cohen and Colligan 1998, p22)it is suggested* that workers without Occupational Health and Safety training would appear at high risk for workplace injury and illness and where training is given, the adequacy of the procedures becomes the issue.

When it comes to Occupational Health and Safety , the difference between effective and ineffective training may be death , injury, pain, suffering and lost profits (Whiles, 1999,10). The method of delivery and course content must be tailored to meet the needs of the trainee as well as meeting financial constraints.

The first step in developing a training program is to find out what training is needed (Rogers 1991, 20)

1. Conduct a task analysis - list all occupations at your workplace and reduce each occupation to the tasks performed.
2. Identify the critical tasks - Those that have the potential to or have produced substantial personal or property damage.
3. Review accident records to gain insight into training required
4. Conduct surveys and interviews with the workforce to gain their ideas on what training they think would help them perform their work more safely and efficiently.
5. Review legislation to gain insight into training needs. Valuable information about Training needs analysis can be obtained from an Australian Institute of Training And Development booklet on this subject.

Clear written training objectives will help keep the training on track and point out areas that need improvement (Rogers 1991,20)

An instructional plan that outlines what information is to be conveyed, how and by whom is important. It is important to have some method for evaluating training. The key is to determine if the trainee can perform the new skills on the job.

Zalbewski (interviewed in Sommerville 1997, 26-27) offers the following tips to ensure safety training will stand up to courtroom scrutiny.

**Keep up to date**

**Pursue relevant qualifications**

**Have a session plan**

**Follow the session plan**

**Review session plans**

**Review training aids**

**Make testing appropriate**

**Document everything**

**Keep accurate records**

**Avoid dismissing class early**

**Maintain training focus**

## Does training make a difference?

To know whether or not your training is doing its job you need to answer three very specific questions. (Cheeseman, 1997,56)

1. Did trainees learn the course content?
2. Do they apply the training on the job?
3. Does the training make a difference?

1. Before any training session is complete the instructors must determine if the participants have successfully met the training objectives of the course. Precourse and post course tests are appropriate. If skills training is being conducted written tests should be supplemented by performance demonstrations
2. Transferring learning from the classroom to the workplace is the goal of any training session. Job observation and conducting surveys of job performance can be appropriate here.
3. If the right learning has been delivered effectively to those who really need it . consistent application should result in better job performance. Performance data can be obtained from document searches, surveys, interviews and direct observation.

Two common difficulties often widely separate ineffective from effective training (Montante 1996, 32-33)

1. Lack of training objectives
2. Failure to evaluate training.

Effective training can be achieved by following six steps (Bird and Gremain , 1985, p260)

1. Pinpoint training needs
2. Set training objectives
3. Decide how to best meet the specific objectives.
4. Secure / develop the program
5. Conduct the training
6. Evaluate the training

The author has attended a number of training sessions courses himself and his critical reflection on this attendance has revealed to him that it is common practice in industry to not carry out a detailed training needs analysis prior to embarking on training and also that evaluation of training is not done well. The author completed a Bachelor of Education with an Adult & Workplace Education major in recent years, this course emphasised the necessity of carrying out a detailed training needs analysis prior to embarking on training. Proper, detailed evaluation of training was also emphasised as being necessary.

Evaluation can be performed at any of three stages - input, output, outcome.

Input (costs of or time used to develop training) can be compared to planning on budget figures.

Output can be assessed in terms of the number of people trained in a period of time, cumulative training costs and / or percentage trained versus a performance standard.

Outcome can be determined by measuring and evaluating the following criteria (Montante 1996, 34) .

Reaction	surveys or interviews to gauge the emotional response of participants to training
Knowledge	usually involves before and after tests of knowledge gained or understanding achieved with respect to training objectives
Behaviour	may involve proficiency tests, direct observation or self reports of skill performance
Results	calculated by direct calculation of losses, claims on rates and/or change in waste, productivity, quality and cost performance

1. Different reviews of the general (as opposed to specifically safety training) literature (Goldstein and Buxtan 1982, Campbell 1988, emphasise the importance of certain elements to an effective training program. The (OSHA) set of voluntary training guidelines to assist employees in furnishing safety and health information and instructions to workers (OSHA 1988) mimics the same elements within an Occupational Health and Safety context.

2. Needs assessment
3. Establishing training objectives
4. Specifying training content and media
5. Accounting for individual differences
6. Specifying learning conditions
7. Evaluating training

According to Kirkpatrick (1967, ) training evaluations can take on four forms which are reviewed as a series of steps or levels

1. Reaction
2. Knowledge gained or skills acquired
3. Behaviour change
4. Results

#### Reaction

Typically when seeking reaction to a training session participants are asked to complete a "course-review form" at the conclusion of each session of the course Typical questions to complete may include

What was the most useful session on the course?

What was the least useful session on the course?

Was the venue appropriate?

How could the course be improved?

These questions seek out reaction to the course but do not measure learning or effectiveness, somewhat cynically some experienced trainers refer to these course review forms as "happyness sheets"

#### Knowledge gained or skills acquired

With this method of evaluation questions are asked to test the transfer of knowledge to the course participant eg.

1 Describe the 4 methods of X

2 Explain how to Z

3 Give me the formula for W

Alternately skills may be tested eg.

1 Show me how to tie a bowline

2 Demonstrate how to change the grinding wheel on that angle grinder

#### Behaviour Change

Behaviour change is very important to measure but measuring it can prove difficult. Asking the course participant how his / her behaviour has changed after they have had sufficient time to put the course learnings into practice can be a valuable approach. Interviewing supervisors and peers about the participants change in behaviour since the training can also be worthwhile.

#### Results

Measuring the results of training in economic terms can be very difficult. Return on investment for training is what managers are seeking. Establishing control groups who have not been trained and comparing their performance with experimental groups who have been trained is the desired approach

Common practice in industry is to measure the reaction but this can have little relationship to the degree of actual learning. The effect of training is greatly affected by other workplace factors both in the training and post training environment.

OSHA has training guidelines to assist employers in furnishing safety and health information to workers (Cohen & Colligan p10-11) The guidelines are voluntary and are meant to enhance or supplement other employer training activities. The seven guidelines are:

1. Determining if training is needed
2. Identifying training needs
3. Identifying goals and objectives
4. Developing learning objectives
5. Conducting the training
6. Evaluating program effectiveness
7. Improving the program

Successful training outcomes appear greatly influenced by management roles in support of safety training especially in its transfer to the job site .(Cohen and Colligan 1998, 40)

Policies which favour opportunities for applying the knowledge gained from training or re-inforce learned behaviours and incentives or other means produce optimum results.

# Adult Learning Principles and Process

The following (based on recent learning) is a summary of a paper the author has prepared to guide his own efforts in developing and facilitating OHS learning for adults in the workplace.

The teaching of adults (andragogy) has many differences to the teaching of children and other young people (pedagogy). Adults have considerable life experience to bring to the training room and are more likely to question training input that does not accord with their life experience.

This brings considerable challenges but also considerable satisfaction to the facilitator.

## Andragogy

Critical reflection is an important element in andragogy and this happens most naturally when the content of a class invites involvement, when students are encouraged to respond to the material by drawing in a disciplined way from their life experiences. For students creative reflection and criticism depend on seeing themselves as central to their learning, a feat accomplished not by a teacher saying that something is "student-centred" but through the experience of being at the centre. Reflection helps move learners to greater complexity and sophistication in their understanding of any material presented.

. Those interested in further exploration of the concepts of andragogy should refer to Knowles(1980), Savicevic(1981), Griffin(1983), Jarvis( 1984)32-38 and Tennant(1986) Andragogy as a concept is very important for adult learning generally but particularly safety learning where lives can be saved with appropriate transfer of skills, knowledge and abilities.

The following is a selection of theoretical concepts relevant to facilitation of adult learning

## What the adult learning theory means to the learning facilitator

### **A. Minimise the use of lecture style presentations.**

There is room for the content expert to explain the theory but this should be minimised.

For the learning to have meaning activities should be organised to allow participants to discover the concepts for themselves (not always an easy thing to do). Discussions, case studies, practical exercises, role plays are preferred. These are usually more effective learning methods than the lecture but they take a longer period of time. Activities must be as close to real life as possible and a content expert must be on hand should participants feel the need for his/her input.

Some theoretical input is given and the opportunity for critical reflection (via an activity or discussion) is important.

Assessment is regarded as an opportunity to revise concepts as well as evaluation.

The focus must be on the learner not the facilitator.

Learning objectives must be stated for each session and a participative process put in place to achieve these objectives.

Learning must relate to learners prior experience and knowledge.

Avoid the impression that the facilitator is the all knowing "expert", rather he/she is an organiser and facilitator of a participative supportive learning environment.

Far too often training activities are devised by trainers or managers who are removed from the workplace environment of trainees. The content represents what the trainer or manager thinks is what is required, often this approach misses the mark. Major efforts must be made to consult with the work force on their perceived training needs. The SKILLS, KNOWLEDGE and ATTITUDES (OR ABILITIES) to perform tasks must be examined to gain insight into deficiencies; in some cases when gaps between current competencies and desired competencies are revealed, training will Explain "What's in it for me" early in the session and elicit participants expectations of the training in initial stages.

Learning must be appropriate for what is necessary for people to do the job.

Have frequent breaks and don't overload participants with theory.

You might like to keep the following phrases in your mind.

Learning is what you do to yourself.

Training is what others do to you.

Learn a little - well.

## B. Interactive Learning Strategies

For adults interactive rather than passive learning strategies are preferred.

It has been suggested that for effective learning and behaviour change:

Talk only	2 % possibility of behaviour change
Talk and Model	10% possibility of behaviour change
Talk ,Model and Practice	20 % possibility of behaviour change
Talk, Model, Practice and on -site Coaching	80% possibility of behaviour change

(Joyce quoted in Excellence in Training,1992)

Saying and doing are certainly important for retention and later application.

Interactive strategies, provide advantages to both student and teacher, compared with other methods:

They suit most learning styles.

Most students enjoy learning or consolidating knowledge by taking part in such activities. They enjoy the variety.

## C. Smith and Delahaye Learning Principles

In their excellent text *How To Be An Effective Trainer* Smith & Delahaye refer to certain learning principles.

Whole or part learning Divide the learning into manageable segments and work from the known to the unknown.

Spaced Learning Learning that is spaced at reasonable levels is usually superior to massed or crammed learning if you want long term retention.

Active Learning

If trainees are actively involved in the learning process (instead of listening passively), they will learn more effectively and become self-motivated. Active learning is often described as "learning by doing".

Feedback

Give the trainees feedback on progress early and regularly and also obtain feedback on how you are progressing as a trainer.

Overlearning

Stated simply, overlearning means learning until one has perfect recall - and then learning it some more. In other words, forgetting is significantly reduced by frequently attempting to recall learned material.

Reinforcement

Learning that is rewarded is much more likely to be retained.

Primacy and Recency

Given any sequence of facts, trainees will tend to remember what they heard first and last. What they heard in the middle they often forget. Therefore, emphasise and reinforce facts that are in the middle.

Meaningful Material

When presented with new information, we unconsciously ask two questions:

Is this information valid when I compare it with experiences I've had in the past?

Will this information be useful to me in the immediate future?

The implication of these questions means that one must move from the known to the unknown and ensure information is readily useable by participants.

Multiple-Sense Learning

Always use sight and hearing but do not neglect the other senses.

Transfer of Learning

The amount of learning that trainees transfer from the training room to the workplace depends, mainly, on two variables(Smith & Delahaye, 1987)

The degree of similarity between what was learned in the training program (and this includes how it was presented) and what occurs at the workplace.

How easily the trainees can integrate into the work environment the skills or knowledge gained in the training program.

The presence of these two variables stresses the importance of referring continually to the workplace when looking for ideas on how to present information or skills and when designing activities and tests for the training session.

#### **D. Retention and Transfer of Learning**

In order for learning to occur successfully, the adult learner must (Morgan, Holmes and Bundy, 1976):

- Be motivated to learn.
- Establish an attentional set.
- Be in a state of developmental readiness to learn.
- Be in an environment conducive to learning.

Adults are best motivated to learn when that which is to be learned relates or is meaningful to their needs, goals, habits, values, and self-concept. The adult's willingness to participate in learning depends upon such factors as: perception of the value of learning, acceptance of what and how to learn, need for self-esteem or social affiliation with others, and expectations from life.

Teachers of adult learners can facilitate the retention and transfer of learning by such activities as the following:-

- Encouraging the learner to search for relationships between what is currently being learned and past learning.
- Providing reviews in which the learner encounters previously learned material within new activities.
- Providing well-distributed practice in problem solving.
- Relating materials learned in instruction to the abilities, needs and interests of the learner.
- Stressing generalisations, but making certain that the learner understands the meaning and factual basis for each generalisation thought.
- Scheduling frequent tests or in other ways creating a "set" to remember.

Inducing low stress by arranging for success or anticipation of successful experiences in learning.

#### **Lawler's Principles of Adult Education (Lawler 1991)**

- Principle 1. Adult education requires a physical and social climate of respect.
- Principle 2. A collaborative mode of learning is central to adult education.
- Principle 3. Adult education includes and builds on the experience of the participant.
- Principle 4. Adult education fosters critical reflective thinking.
- Principle 5. Problem posing and problem solving are fundamental aspects of adult education.
- Principle 6. Learning for action is valued in adult education.
- Principle 7. Adult education is best facilitated in a participative environment.
- Principle 8. Adult education empowers the participant.

In *The Keys to Adult Learning Theory and Practical Strategies* Lawler offers practical advice on utilising these adult learning principles and is well-worth a read.

#### **A. Action Learning**

There is a large body of research literature that suggests that action learning is particularly appropriate for adults. Action learning is a process (Weinstein 1995,9) underpinned by a belief in individual potential: a way of learning from our actions (and from what happens to us and around us) by taking the time to question and reflect on this in order to gain insights and consider how to act in the future. There are 2 other elements to action learning: it involves a group of people who work together on their "doing" and their "learning", and it requires regular and rigorous meetings of the group, to allow space and time for this process of questioning and reflection.

Learning may be defined (Mezirow 1991,1) as the process of making a new or revised interpretation of the meaning of an experience which guides subsequent understanding, appreciation and action. Critical reflection involves a critique of the pre-suppositions on which our beliefs have been built.

Marsick (1991, 23-45) speaks about action learning (Project work on real-life problems and reflection where participants draw out the lessons learned from their project work.)

There are three key components of the action/learning facilitation process : action, reflection and the building of ones own theories (Marsick 1991, 32-33). The action component is developed in two ways " through appropriate experience provided by the project work and through an action oriented approach to the way in which people learn

from experience.

For action learning to be effective (Marsick 1991, 44) a climate must be fostered that allows participants to examine beliefs, practices and norms. The facilitator must make sure learners look at problems from many perspectives, challenge one another, ask stupid questions, draw contrasts, probe connections and try out new behaviours.

The video "An Introduction to Action Learning" The National Staff Development Committee (1995) outlines the benefits and process of action learning.

The following equation is referred to:

$L = P + Q$ where	L	=	Learning
	P	=	Programmed knowledge balanced with
	Q	=	Questioning insight

## B. Experiential Learning

This has some similarities to action learning and once again is thought to be particularly relevant to adult learners.

Boud, Cohen and Walker (1993, 8-16) have developed five propositions which will help the adult educator to develop effective experiential learning.

Experience is the foundation and stimulus for learning.

Learners actively construct their experience.

Learning is a holistic experience.

Learning is socially and culturally constructed.

Learning is influenced by the socio-emotional context in which it occurs.

Kolb and Fry (1975, 33) have developed an experiential learning model.

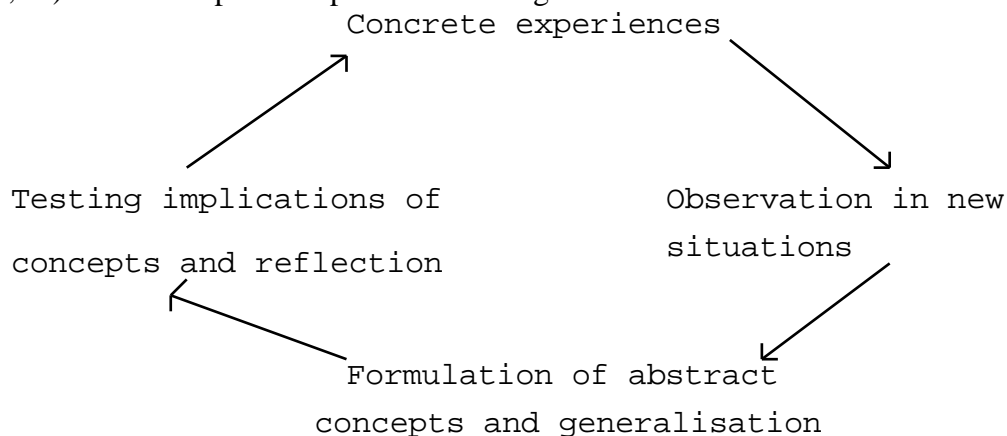


Figure 1 : Experiential Learning Model, Kolb and Fry (1975, 33)

Experiential learning is based on three assumptions (Johnson 1990, 20). People learn best when they are personally involved in the learning experience; knowledge has to be discovered if it is to mean anything or make a difference in behaviour and commitment to learning is highest when people are free to act their own learning goals and actively pursue them within a given framework.

The process of experiential learning is shown below. (Johnson 1990, 20) The learner reflects on their concrete experiences and examines their meaning in order to formulate a set of concepts or principles. The sequence is concrete personal experiences followed by:-

Observation and reflection and examination of one's experiences and this leads to the formulation of abstract concepts and generalisations which leads to hypotheses to be tested in future action.

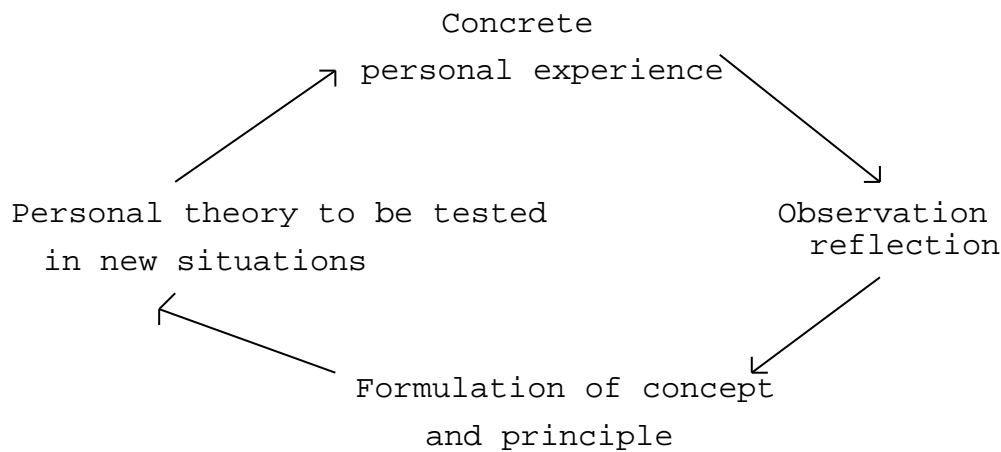


Figure 2 : Experiential Learning Cycle (Johnson 1990, 20)

### C. Learning in the Workplace

In Billett (1993, 1) it is argued that informal learning settings such as workplaces provide an optimal place for the acquisition of robust and transferable vocational skills. The training that is conducted is in the workplace using situations as close as practicable to those encountered in the workplace. The process used models the most traditional forms of learning - the notion of an expert novice relationship (Billett 1993,2). The approach used utilises activity theory originally proposed by Vygotsky who claimed that knowledge is socially and culturally constructed. Central to Vygotsky's view is that the relations between the learner and the teacher/expert is socially constructed. Consequently, the quality of the relationship will determine what type of knowledge the novice has access to and is allowed to learn (Billett 1993,3).

Billett (1993,4) maintains the authenticity of learning activities is a determining quality of learning experiences.

Research carried out by Billett (1993,5) in the Queensland Coal Mining Industry revealed a preference for learning by doing on behalf of respondents. The respondents also believed that the expertise for learning was already on site. The following quote from Billett (1993,10) appears relevant.

"The engagement of learners in authentic activities in natural settings, guided by experts with reference to other learners and by allowing the learner to experience both the process and the product of their activities have the potential to make the workplace a powerful learning experience."

Billett (1992,4) indicates the skill development activities and assessment should only be conducted by those who have and are seen to have a strong base of skills in a specific area (a content expert). It is also postulated that activities should closely reflect the activities that are used as part of everyday practice in the workplace (authentic activities). This emphasises the role of natural settings and authentic activities and reflects the research of Glaser (1984), Glaser and Bassok (1989), Collins Brown and Newman (1989), Collins and Duguid (1989), Gott (1989) and Raizer (1991). Billett (1992,5) speculates that a learning process that gives responsibility for the learning to the learner, engages them in dialogue with more expert workers, asks them to problem-solve real situations and then provide an analysis of their approach is appropriate. Billett (1992,6) says that learning tasks must be realistic, challenging but ultimately achievable.

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