Human factors psychology: 23 facts you need to know

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Human factors refer to environmental, organisational and job factors, and human and individual characteristics, which influence behaviour at work in a way which can affect health and safety. (Stanton et al.; 2005) This definition includes three interrelated aspects that must be considered: the job, the individual and the organisation:

The job – *Human factors psychology* states tasks should be designed following ergonomic principles to take account of both human limitations and strengths. This includes matching the job to the physical and the mental strengths and limitations of people. Mental aspects would include perceptual, attentional and decision-making requirements.

The individual - including his/her competence, skills, personality, attitude, and risk perception. Individual characteristics influence behaviour in complex ways. Some characteristics such as personality are fixed; others such as skills and attitudes may be changed or enhanced.

The organisation - including work patterns, the culture of the workplace, resources, communications, leadership and so on. Such *human factors* are often overlooked during the design of jobs but have a significant influence on individual and group behaviour.

In other words, *human factors* are concerned with what people are being asked to do (the task and its characteristics), who is doing it (the individual and their competence) and where they are working (the organisation and its attributes), all of which are influenced by the wider societal concern, both local and national. (Kirwan; 1994)

Human factors interventions will not be effective if they consider these aspects in isolation. The scope of what we mean by *human factors* includes organisational systems and is considerably broader than traditional views of *human factors*/ergonomics. *Human factors psychology* can, and should, be included within a good safety management system and so can be examined in a similar way to any other risk control system. (Wilson et al.; 1995)

The Business Benefit

Managing human failures is essential to prevent major accidents, occupational accidents and ill health, all of which can cost businesses money, reputation and potentially their continued existence. The influence of biological, psychological and organisational factors on an individual at work can affect their health and safety, but it also affects their efficiency and productivity.

Successful businesses achieve high productivity and quality while ensuring health and safety. Good technology combined with the best work systems can help to achieve these goals. The best work systems

are based on having a skilled workforce, with well-designed jobs that are appropriate to individuals' abilities.

Facts you need to know

The Dirty Dozen refers to twelve of the most common human error preconditions, or conditions that can act as precursors, to accidents or incidents. These twelve elements influence people to make mistakes. (Gordon Dupont; 1993)

1. Lack of communication

Poor communication often appears at the top of contributing and causal factors in accident reports and is therefore one of the most critical *human factor* elements. Detailed information must be passed before, during and after any task, and especially across the handover of shifts. Assumptions should be avoided and opportunities for asking questions both given and taken.

1. Complacency

Such a feeling often arises when conducting routine activities that have become habitual. Whilst too much pressure and demand causes over-stress and reduced human performance, too little results in under-stress, boredom, complacency and reduced human performance. It is therefore important when conducting simple, routine and habitual tasks, and when fatigued, to maintain an adequate, or optimum, level of stress through different stimulation.

1. Lack of knowledge

Lack of on-the-job experience and specific knowledge can lead workers into misjudging situations and making unsafe decisions. It is important for employees to undertake continuing professional development and for the most experienced workers to share their knowledge with colleagues. Part of this learning process should include the latest knowledge on human error and performance.

1. Distraction

Distraction could be anything that draws a person's attention away from the task on which they are employed. Psychologists say that distraction is the number one cause of forgetting things: hence the need to avoid becoming distracted and to avoid distracting others. Management has a role to play in reducing the distractions placed on their employees. This may involve good workspace design, management of the environment, and procedures that create "safety zones", "circles of safety" or "do not disturb areas" around workers engaged in critical tasks.

1. Lack of teamwork

In aviation many tasks and operations are team affairs; no single person (or organisation) can be responsible for the safe outcomes of all tasks. This means that workers must rely on colleagues and other

outside agencies, as well as give others their support. Teamwork consists of many skills that each team member will need to prove their competence. A team's effectiveness can also be improved through the selection of team members to reflect a broad range of experience and skillsets, and also through practice and rehearsal.

To create an effective team it is necessary that the following issues, as appropriate, are discussed, clarified, agreed, and understood by all team members:

1. A clearly defined and maintained aim, or goal(s)
2. Each team member's roles and responsibilities
3. Communication messages and methods
4. Limitations and boundaries
5. Emergency procedures
6. Individual expectations and concerns
7. What defines a successful outcome
8. Debriefing arrangements
9. Team dismissal arrangements
10. Opportunities for questions and clarification

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1. Fatigue

Fatigue is a natural physiological reaction to prolonged physical and/or mental stress. We can become fatigued following long periods of work and also following periods of hard work. As we become more fatigued our ability to concentrate, remember and make decisions reduces.

Fatigue self-management involves a three-sided programme of regular sleep, healthy diet (including reduced use of alcohol and other drugs), and exercise. Work of a critical and complex nature should not be programmed during the low point on the body's circadian rhythm (usually 03:00 – 05:00 am); and, when fatigued always get someone else to check your work.

1. Lack of resources

If all the parts are not available to complete a maintenance task, then there may be pressure on a technician to complete the task using old, or inappropriate parts. When the proper resources are available, and to hand, there is a greater chance that we will complete a task more effectively, correctly and efficiently. Therefore, planning to acquire, store and locate resources is essential. It will also be necessary to properly maintain the available resources; this includes the humans in the organisation as well.

1. Pressure

The pressure is to be expected when working in a dynamic environment. However, when the pressure to meet a deadline interferes with our ability to complete tasks correctly, then it has become too much. It is the old argument of Quantity versus Quality.

Learning assertiveness skills will allow a worker to say 'No', 'Stop!', and communicate concerns with colleagues, customers and the Company. These skills are essential, and when deadlines are critical, then extra resources and help should always be obtained to ensure the task is completed to the required level of quality.

1. Lack of assertiveness

Being both unable to express our concerns and not allowing others to express their concerns creates ineffective communications and damages teamwork. Assertiveness techniques can be learnt and they focus on keeping calm, being rational, using specific examples rather than generalisations, and inviting feedback. Most importantly, any criticisms should be directed at actions and their consequences rather than people and their personalities; this allows others to maintain their dignity, and a productive conclusion to be reached.

1. Stress

There are two distinct types - acute and chronic. When we suffer stress from these persistent and long-term life events, it can mean our threshold of reaction to demands and pressure at work can be lowered.

It is important to recognise the early signs of stress and to determine whether it is acute or chronic. However, perhaps more effective is having channels of communication readily available through which to discuss the issue and help to rationalise perceptions. Companies ought, therefore, to have employee assistance (or wellbeing) policies that include stress reduction programmes.

1. Lack of awareness

Working in isolation and only considering one's responsibilities can lead to tunnel vision; a partial view, and a lack of awareness of the effect our actions can have on others and the wider task. It is important to build experience throughout our careers, especially concerning the roles and responsibilities of those we work with, and our place in the wider Team.

Developing our foresight is essential in pre-empting the effects our actions may have on others. This is an attitude of professionalism and involves constant questioning "what if …?" Asking others to check our work and challenge our decisions is useful in gaining the relevant experience and expanding our awareness. Vigilance is closely related to situational awareness, and workplace procedures, such as scanning, two-way communication and use of checklists will help to maintain vigilance.

1. Norms

Workplace practices develop over time, through experience, and often under the influence of specific

workplace culture. These practices can be both, good and bad, safe and unsafe; they are referred to as "the way we do things around here" and become Norms. Unfortunately, such practices follow unwritten rules or behaviours, which deviate from the required rules, procedures and instructions. These Norms can then be enforced through peer pressure and force of habit. It is important to understand that most Norms have not been designed to meet all circumstances, and therefore are not adequately tested against potential threats.

1. Rules and procedures

Should have been designed and tested, and therefore ought to be enforced and followed rigorously. Where workers feel pressure to deviate from a procedure, or work around it, then this information should be fed back so that the procedure can be reviewed and amended, if necessary. Developing assertiveness can allow workers to express their concerns about unsafe Norms, despite peer pressure.

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