

A PRACTICAL SOLUTION – METHODS TO IMPROVE HUMAN PERFORMANCE

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INTRODUCTION

Performance is one of the key concepts within work and organisational psychology and it is one that encompasses a very diverse array of topics and factors. Included in the analysis of performance in the workplace are topics as dissimilar as ergonomics and environmental factors, motivation, competence, feedback, emotions, work hours and various social and organisational factors. When one is faced with the task of identifying practical solutions in an attempt to improve human performance at work, one is confronted with a vast 'ocean' of research through which to wade. Some of the research is better than others however and some of that some more applicable to the needs and requirements that face the forestry industry than others. Before we take a journey into some of the better approaches to improving human performance in the workplace or workspace, it would be useful to establish for ourselves a definition of performance and a framework within

which the information can then be organised.

When discussing the topic of work performance what exactly are we referring to? Roe (1999) proposes a distinction between two kinds of performance, a process definition and an outcome definition:

- Performance is the process by which people (individually or collectively) try to achieve a given work goal.
- Performance is the congruence between the work goal and the outcome of the process by which people (individually or collectively) try to achieve that work goal.

Embedded within these definitions is the notion of a required or expected performance standard to which the performance of the individual(s) can be assessed as being either above, below or somewhere in between what is expected. In other words, some individuals may be found to perform

better on the task than others or those same individuals may be found to perform better at the same task under different conditions.

Understanding the factors that mediate the level of congruence between the work goal and the outcome of the process by which people try to achieve that work goal, will place us in a better position to manipulate or alter those factors. This will enable us to maximise the levels of congruence and by so doing maximise the levels of performance. To understand why some people perform better than others or perform better than themselves on two separate occasions, we need to understand the factors that mediate or influence the congruence between the work goal and the outcome of the work action. By identifying these factors we can establish what conditions are likely to produce success or failure and in so doing identify practical solutions or methods to improve human performance within the workplace.

A theory that has identified these factors has been developed, The Classical Theory of Work Performance (Blumberg and Pringle 1982). The theory postulates that all of the factors that could potentially influence the

performance-outcome relationship can be categorised under the three broad concepts of capacity, opportunity and willingness.

- *Capacity*-Refers to cognitive and physiological capabilities
- *Opportunity*- Refers to external factors that enhance or constrain performance that are beyond the direct control of the individual
- *Willingness*- Refers to psychological and cognitive characteristics that influence the extent to which an individual is inclined to perform a task.

The classical theory will provide us with a framework within which the following discussion can be organised. More specifically, the solutions or methods to improve human performance will be arranged under the headings of capacity, opportunity and willingness.

Rather than providing a description of all the factors that have been found to influence performance, I have chosen to focus on some of the more validated and consistently successful methods. The practical relevance of the methods and their timeliness and applicability to

the needs of the forestry industry was also taken into account when selecting them. In view of this, the following methods will be discussed: personnel selection, personnel training, and communication with an emphasis on performance feedback, shift schedules and in particular rest pauses, and motivation with an emphasis on organisational commitment.

There has traditionally been a lack of appreciation of these factors in forestry to date and it is important that they are embraced and the recommendations that are made are adhered to if the performance of man and machine is going to be fully realised in this industry. The increasing competition and ever changing market conditions means that now, more than ever before, performance levels need to be at their optimum. The practical methods for improving work performance should not be ignored.

CAPACITY FACTORS

Capacity refers to the physiological and cognitive capabilities that enable an individual to perform a task (Blumberg & Pringle 1982). According to this definition some individuals are going to be more capable of

performing a task than others. This may be due to their superior mental and physical ability or capacity. There are two commonly used methods for improving or controlling for human performance according to their capacity. The first is in the area of personnel selection and is involved in the identification and selection of those individuals most capable of performing the task effectively. The second is in the area of personnel training which is involved in the up-skilling of current staff for the purpose of improving or enhancing their current capabilities to perform the task at hand. Garland (1986) has consistently asserted that there is a need for research and practical improvements in forestry in both of these areas.

Personnel Selection

Selection is the process by which individuals are systematically assessed and compared on their ability to perform a task. The area of personnel selection constitutes one of the major areas of industrial and organisational psychological research and practice. It is also an area in which a number of researchers within the forestry industry in this country and overseas have identified large gaps between what is

recommended and what is actually being done (Cummins 1998, Sullman & Evanson 1998, Byers 1995, Kirk, Byers, Parker & Sullman 1997, Garland 1986).

There are a number of advantages associated with the utilisation of standardised, validated selection methods. Currently, machine operator selection in this country involves a high degree of trial and error, with operators being trialed on machines in a haphazard manner. The costs associated with a machine operator failing to become a successful operator are potentially huge. Factors such as a slow learning curve, machine breakdowns and downtime, and the loss of operational productivity that could have been occurring if a more suitable individual was selected for the position, mean that better selection methods are needed. Past research has also shown that more competent performers are more likely to maintain lower rates of injury (Sluss 1992). Turnover rates could also be expected to drop as more suitable individuals are selected for the machines. If formal training programs similar to those in Australia and Europe are established, individuals most likely to succeed or benefit from the training in a crew or

gang could also be identified and selected

For the best possible prediction in the practice of employee selection, a strong relationship must exist between the content of the job and the content of the selection method. All good quality selection procedures are based upon the information obtained from a systematic job analysis. The general purpose of a job analysis is to enable us to break a job down into its components or discrete parts (Landy 1989). In other words the analysis helps us determine and identify the different aspects involved in the completion of a particular job or task. The information obtained from job analysis can then be used for a number of purposes and it is only through the process of job analysis that specific organisational initiatives and improvements such as selection can be made. Once we have identified what is involved in a particular position we can then go about finding people with the necessary capabilities to fill the position.

There are a number of different methods to conduct quality personnel selection. Some of the most common methods are the employment interview,

application forms and curriculum vitae, weighted application forms, references and testimonials, work sample tests, assessment centres, psychometric testing including personality and cognitive ability tests, and more obscure methods such as handwriting analysis and astrology which have been proven to be useless for predicting future behaviour. Latest research indicates that cognitive ability testing, integrity testing and work sample tests are the most predictive instruments available (Schmidt & Hunter 1998).

LIRO has just completed a job analysis of the Waratah harvesting machine position to identify the competencies needed to operate the machinery for the purpose of developing a selection procedure to identify those individuals who are more likely to become successful operators from those who are not. The analysis revealed eight key competencies that characterise successful Waratah operators. These included: log making ability, mechanical ability, computer knowledge, ability to position the machine and logs, ability to drive the machine base, an awareness of safety, personality characteristics that include being flexible and being able to cope

with stress and the ability to participate as part of a team.

Personnel Training

Training in industry has been defined as "a set of planned activities on the part of an organisation to increase the job knowledge and skills or to modify the attitudes and social behaviour of its members in ways consistent with the goals of the organisation and the requirements of the job" Landy (1989). This definition has three noteworthy components:

- By "planned activities" we mean that training is a systematic and intentional process, not random or haphazard
- "Modify the attitudes and behaviour," means that training is designed to alter behaviour (directly or indirectly). People should do things differently after training,
- Finally, "with the goals of the organisation" refers to why training is conducted in the first place: its purpose is to alter people's behaviour in a way that will contribute to organisational effectiveness. Fortunately, in most

cases the change in behaviour also contributes to the individual's effectiveness at work, so people are rarely trained against their will.

Any behaviour that has been learned is a skill. Within the area of training, the learning process is task oriented, it enhances skills. Training therefore, is directed toward enhancing a specific skill, which in turn enhances a person's proficiency or capacity in performing a certain task. Skills become the "target areas" of training, especially personnel training. In industry, training enhances three broad classes of skills; Motor skills refer to the manipulation of the physical environment based on certain patterns of bodily movements. Cognitive skills relate to the acquisition of mental or attitudinal factors. Interpersonal skills refer to enhancing interactions with other people. Though all three types of skills are the focus of personnel training, their relative importance depends on the nature of the job. Machine operators for example need to be trained in motor skills; managers need cognitive and interpersonal skills.

Training can contribute to organisational goals in a number of ways:

- Reducing labour costs by decreasing the amount of time it takes to perform tasks involved in producing goods or services
- Reducing the time needed to bring the inexperienced employee to an acceptable level of job proficiency
- Reducing the costs of materials and supplies by reducing losses due to excess waste and the production of defective products
- Reducing the costs associated with personnel activities such as reflected turnover, absenteeism, accidents, grievances, and complaints
- Reducing the costs associated with efficiently servicing customers by improving the flow of goods or services from the company to the consumer.

The first step in the design of a training program is to identify what the specific training needs are, or in other words, identifying what incongruence exists between what the workers are capable of and what the task or tasks requires of them. After determining an organisation's training needs and translating them into objectives, the next step is to design a training program to meet these objectives.

There are many training methods available. They can be classified in a number of ways, though probably the best way is according to where the training takes place.

On-site training methods include on the job training, vestibule training, job rotation, and apprentice training. Off-site training methods include: lectures, audio-visual material, conferences such as this one, programmed instruction, computer assisted instruction, simulation exercises and role-playing.

During the course of the human computer evaluation that we conducted on the Waratah harvesting machine it became apparent that there was a number of training needs. Unfortunately, no formal training program is currently available and many operators reported being trained by someone from their own gang who themselves were not completely capable. This led to a number of problems as many of the new operators stumbled through their use of the interface. In addition to this, many operators were not aware of the many functions that the interface provided for them and this deficit meant that many of the machine capabilities were

not used. A formalised, thorough training program for Waratah operators is essential. This is however not entirely Waratah's problem as the contractors themselves are careless about ensuring that their operators are fully capable.

Parker, Kirk and Sullman (1996) have argued that the benefits of operator training include; reaching a faster rate of productivity in a shorter period of time, less machine damage, lower site damage and reduced operator injuries such as OOS and musculoskeletal disorders. Both Johansson and Strehlke (1996) and Sullman and Evanson (1998) have also argued that operator training is imperative due to the large costs associated with operator inexperience, machine downtime and repairs.

In addition to this, research on the economic viability of forest worker training has indicated that the costs associated with training are recouped through increased productivity and safety indicating that training is cost effective in such settings (Garland 1990). Recent changes in the accident insurance scheme in this country might also influence the long-term financial benefits associated with training.

OPPORTUNITY FACTORS

Opportunity factors consist of those factors that surround an individual and their task that facilitates or constrains that persons task performance and that are beyond the person's direct control (Blumberg & Pringle 1982). Two of the methods for adjusting opportunity factors for the purpose of bringing about positive changes in work performance are improving the type and nature of communication between and amongst workers especially as it relates to performance assessment, and adjusting shift schedules and rest pauses to facilitate optimum performance.

Organisational Communication

Roe (1999) asserts that some of the most common performance hindering factors in relation to the work environment include: interruptions, physical hindrances, the lack of information, role conflict, role unclarity, role overload and time pressure. The majority of these factors can be eliminated or significantly decreased if communication between workers and workers and workers and

management is conducted in an appropriate manner.

One area of organisational communication that is often neglected or performed inappropriately is performance feedback. According to the traditional models of task performance, feedback is an integral part of the performance process. It is only in relation to feedback that a performer or worker is able to adjust or regulate their behaviour to further reduce the incongruence levels between their own performance and the task goals or standards.

An important factor in the design and implementation of a performance appraisal system is clarifying the criterion or measure of success. A number of different criteria are available. When selecting a measure of performance the relevance, reliability, practicality, and discriminability of the factor(s) need to be taken into consideration. Traditional measures have included production of output, quality of output, trainability, and a variety of personnel data including absenteeism, tenure and rate of advancement.

The following are characteristic of successful performance appraisal systems:

- Clear and relevant training is provided for assessors
- Raters are familiar with the task and criterion
- Precaution is taken against rater bias
- Consistent application of principles is ensured
- Employees have the right to review, comment and appeal throughout the process
- Employees are aware that it is performance on the task that is being assessed and not the employee themselves as this can negatively impact subsequent performance.

Shift Schedules and Rest Pauses

The effect of shift length, shift type and rest structure on performance in the work place has been extensively documented. These factors come under the 'opportunity' influence because they are largely out of the direct control of the worker and yet directly facilitate or constrain their performance. The effect of shift length

will not be covered as it is going to be addressed by another conference speaker. The effect of rest pauses will be covered however.

Generally speaking, a number of short rest pauses during the work day can have a positive impact on performance, particularly if the task is mentally or perceptually demanding (Roe 1999). Kopardekar and Mital (1994) compared a number of different rest schedules among telephone operators. Both thirty minute spans of work followed by five minute rest breaks and 60 minute work spans followed by 10 minute rest breaks produced better subjective responses and fewer errors than two hour work spans without any rest break. Similarly, research by Boucsein and Thum (1997) indicates that short rest breaks (7.5 min every 50 working minutes) are most effective in promoting recovery from mental and emotional strain in the morning, while a longer rest break (15 min every 100 working minutes) is more effective in the afternoon.

It seems as if the recommendations made in the literature regarding shift length and rest breaks are yet to be adhered to in areas of forestry. The practice associated with machine

operator work schedules is a prime example. Harvester operators for example are subjected to very high physical and mental demands, similar to those associated with simulated air traffic control work and higher than those of airline pilots (Sullman & Kirk 1998). As such, previous research has highlighted the need for operators to take regular breaks throughout the day.

WILLINGNESS FACTORS

Willingness refers to the psychological and emotional characteristics that influence the degree to which an individual is inclined to perform a task effectively (Blumberg & Pringle 1982). In addition to motivation, Blumberg and Pringle (1982) argue that willingness refers to the effect of job satisfaction, personality, attitudes, norms, values, task characteristics, job involvement, perceived role expectations and need states. Although covering all of these factors is beyond the scope of this presentation, one of the major factors, motivation will be addressed.

Motivation

Motivation is a complex topic and one that has produced numerous amounts of research and subsequent theory, some more practical than others. One traditional distinction between the antecedents of an individual's motivation that has prevailed is the distinction between trait and contextual explanations. Very briefly, trait explanations attribute the motivational levels of an individual to the individual themselves while contextual explanations attribute motivational levels of individuals to something exterior to the person such as pay levels, leadership structure or organisational culture. Attempting to find practical advice on how to motivate a worker is not an easy task. One useful concept that has emerged is the notion of organisational commitment.

Cropanzano and Greenberg (1997) argue that organisational commitment can be viewed as a multi-dimensional approach involving the willingness to exert effort on behalf of an organisation, loyalty to an organisation, the degree of goal and value congruency with the organisation and the desire to maintain membership in the organisation. The relationships between commitment and motivation

are apparent (Roe 1999). As such the factors that have been found to produce or result in organisational commitment can also be found to influence motivation.

The antecedents of commitment generally fall under two headings, each of which can be positively addressed and the motivation and as such performance improved accordingly.

Organisational Factors. Commitment is higher when:

- There are formally written rules and procedures
- Employees depend on each other
- Where role conflict, role overload and task overload are low
- Organisations are known to look after the interests of its employees
- There is a perceived pay equity
- Workers are made to feel personally responsible for organisational success

Job Related factors. Commitment is higher when:

- The work is challenging
- Participation in decision making is high
- There is social involvement

- Employee needs such as the need for satisfaction, security and affiliation are recognised.

If organisations make use of the above organisational and job related factors, employee commitment and subsequent motivation can be expected.

CONCLUSION

This paper sort to outline some practical methods for improving performance in the workplace. A classical model of work performance in which the capacity, opportunity and willingness factors involved in task performance was used to structure the presentation.

The methods that were recommended to address employee capacity factors were personnel selection and personnel training. The recommendations regarding these practices were outlined. Opportunity factors that were covered included, improving the use of organisational communication particularly in relation to performance appraisal and also implementing rest pauses into work shifts. A willingness factor that was addressed was employee motivation. The concept of organisational commitment was used

to describe the practical ways in which an organisation could improve the motivation of its workers.

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