CHAPTER THREE

ROLE OF FEEDBACK IN LEARNING AND PERFORMANCE

1. LEARNING OLD AND MODERN VIEWS
2. TYPES OF FEEDBACK
3. FACTORS AFFECTING FEEDBACK
4. EFFECTS OF FEEDBACK ON LEARNING
LEARNING: OLD AND MODERN VIEWS

Learning is a very pervasive phenomenon occurring in all of the important aspects of human life. It occupies a strong interest among psychologists because so much of man's behaviour is affected by the process. The capacity to apply to future situations, the experience gained through learning is of great importance to an organisation, an individual organism which fails to learn or benefit from experience tends to repeat past mistakes whereas one who learns from experience succeeds in its interactions with the environment.

It is extremely difficult to formulate a satisfactory definition of learning so as to encompass all the activities and processes that can be included. A number of definitions has been given by psychologists. A peculiar but none the less serviceable definition is the following:

Learning refers to the change in a subject's behaviour to a given situation brought about by his repeated experience in that situation provided that the behaviour change cannot be explained on the basis of native response tendencies, maturation or temporary states of the subject.
The traditional definition of learning which still are widely employed today not only emphasize relatively permanent changes in behaviour but also stress that these changes must occur as a result of experience or practice. By implication, definition of this type focus on the causal role of experience in learning. The words relatively permanent are included in this definition to distinguish learned behaviour from changes that are transient and spontaneously reversible. The definitions of learning in terms of practice tend to separate the effects associated with the genetic background or developmental stage of the organism.

Even with all these qualifications, the traditional definitions of learning exclude a number of important phenomena which seem to belong to this general category. For example, exposure learning, imprinting and habituation would be eliminated because they do not involve practice as it is usually defined, and short-term memory would be excluded because it is not relatively permanent.

Modern views of learning are more mentalistic and nativistic in tone, explaining behaviour as the result of complex mental processes in conjunction with prior experience and current stimulation. There appears to be a
trend in which greater effort is being made to tap the
cognitive capacities of the organism with less
attention being paid to the discovery of experimentally
produced regularities in chain of behavioural output.

It was in the nineteenth century that
psychologists made attempts to describe and explain the
conditions under which learning occurs. As a result of
this certain theories of learning were formulated.
There was a major dispute in the learning theories. Two
main differences among the theories of learning seem most
significant. One of these is the difference between the
connectionist and the cognitive theories. Connectionist
interpretations of learning, however, much they differ
among themselves, agree in treating learning as a matter
of connection between stimuli and responses. Cognitive
interpretations, on the other hand, are concerned with
the cognitions (perceptions or attitudes or beliefs)
that the individual has about his environment and the
ways these cognitions determine his behaviour. In these
interpretations learning is the study of the ways in
which cognitions are modified by experience. The other
major difference is between formal and informal theories
of learning. An informal theorist gives an interpretation
of learning in words. It is more systematic, more precise
and more thorough interpretation. A formal theorist, on
the other hand, tries to make his theory a formal logical
structure. As compared with the informal theorist, he is likely to make greater use of mathematics and to distinguish his intervening variables more rigorously from his independent and dependent variables. Neither the connectionist - cognitive distinction nor the formal - informal distinction is all-or-nothing matter. There are various middle positions between the cognitive and the connectionist and there are varying degrees of formality. The feedback model, for example, given by Mager (1977) represents a middle position between the connectionist and cognitive theory.

Like connectionist theory, it is concerned with fairly mechanistic connections between the stimuli and responses. Feedback theory resembles cognitive theory in its concern with ways in which purposive behaviour is maintained by a flexible control system that takes account of the environment. Perhaps the most striking trend that we observed in recent learning theory was the effort of the connectionist to broaden their systems so they could predict the flexible insightful behaviour of most interest to cognitive theorists.
In the sphere of human learning it is generally conceded that knowledge regarding one's own performance is a necessary condition for learning. The explanation for this fact is generally attributed to either informational characteristic or the reinforcing characteristic of the knowledge of results.

The term 'knowledge of results', which is often simply referred to as KR, is sometimes used interchangeably with the term feedback. By knowledge of results we mean that the information which is available to the subject (S) about his success or failure, while performing tasks, and in turn which helps him to evaluate the response made at the moment or previously made. Its consequences or after-effects on an act, was approved to be the determiners of achievement. It thus helps the 'S' to make a discrimination along a sensory continuum, transferring fine response adjustments from one situation to another and increasing the potential to make a correct response (Maden, 1962). In the form of reward or punishment reinforcement or KR enables the 'S' to make responses toward the goal (Locke, 1967).

"Studies of feedback or knowledge of results... shows it to be the strongest, most important variable controlling performance and learning..." (Fitts, 1964, p 280).
The feedback is often supplied by a direct comparison of actual with required performance. It has two main effects in a vigilance task. It may enable the subject to learn something about the signal, and it may have a motivating or activating effect.

Information feedback (IF) refers to stimuli presented during or after the subject's response and contingent on the response according to a function determined by the experimenter.

\[ \text{IF}_n = f(\text{R}_n - \text{RF}) \]  \hspace{1cm} \text{(Eq. i)}

where \( \text{R}_n \) is a qualitative expression of the response made on Trial \( n \), and \( \text{RF} \) is the value of the correct (required or goal) R. The function \( f \) may convert the R difference to "Yes" or "No", a deflection on a meter, a number with algebraic sign, or any kind of event: the \( f \) represents omission, displacement, or distortion of the error, any temporal or spatial transformation. The essence of IF, then, is in what the \( f \) makes of the discrepancy between obtained and required behaviour. The object is to find how behaviour is related to IF variables, to express:

\[ \text{RF} - \text{R}_n = f(\text{IF}_n) \]  \hspace{1cm} \text{(Eq. ii)}

IF is a stimulus, an independent variable, and not the subject's cognition of the consequences of his behaviour. The experimenter's making information
available (Eq (i)) is not the same as the subject's
taking in, digesting, and using the information (Eq (ii)).
The object of manipulating IF often is just to make
inference about the subject's cognitions or hypotheses
and how IF controls them (R.A.Bilodeau, 1953; Bourne, 1966;
Levine, 1966), but these are consequences of IF, classified
either as R or as intermediate between IF and an overt R.
Knowledge of results is defined by the subject's
awareness of his behavior's consequences rather than by
the experimenter's manipulations of stimuli.

2. TYPES OF FEEDBACK

Holding's (1965) survey makes a useful
classification of kinds of feedback or knowledge of results,
somewhat fusing 32 varieties in a branching family tree.
Holding makes a first dichotomy intrinsic (present in the
standard task) and artificial (added to the standard).

Intrinsic versus Extrinsic Feedback

Knowledge about task performance can come
from cues internal to the organism such as muscle tension,
general body equilibrium, etc. Such feedback is called
intrinsic feedback which is an integral part of the task
itself.

Artificial or extrinsic feedback on the other
hand, refers to cues about performance which come from
sources outside the organism.
Each of these first order dichotomies is in turn divided into concurrent (during R) or terminal (after R is completed); the third order of branching distinguishes immediate (without gap in time between R and IF), the fourth order separates nonverbal (physical instruments) from verbal (words, scores), and the final dichotomy is separate (for each R) vs. accumulated (over several R's). These 32 varieties are shown in Figure 3.1.

General findings concerning KR

Annett (1969) has cogently summarized the research dealing with the KR variable as follows:

1) Under certain conditions simple exposure and familiarization with the learning situation and materials can facilitate later learning.

2) "Positive" KR information seems to be a more effective procedure than "negative" KR.

3) The degree of specificity of KR and its relationship to the learning process is curvilinear. It indicates that learning is facilitated by increased precision in feedback up to a point, but beyond this point learning is hindered with continued increases in precision.

4) Delay time or lay time in KR seems to be generally related to performance, but the relationship is not clear one. Lengthy delays between performance and knowledge of performance are detrimental to learning; perhaps due to lost information. However, at least the data are ambiguous.
**Figure 3.1**

**Varieties of Feedback**

- **Holdings' (1965) Family Tree of Varieties of Feedback**

<table>
<thead>
<tr>
<th>Information Feedback</th>
<th>Concurrent (during R)</th>
<th>Terminal (after R is completed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrinsic</strong></td>
<td><strong>Concurrent</strong></td>
<td><strong>Terminal</strong></td>
</tr>
<tr>
<td><strong>artificial</strong></td>
<td><strong>Delayed</strong></td>
<td><strong>Intruded</strong></td>
</tr>
<tr>
<td>(present in the</td>
<td>(a gap between R &amp; IF)</td>
<td>(added to the standard)</td>
</tr>
<tr>
<td>standard task)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Nonverbal**
- **Verbal**
- **(Physical)**
- **(Bodily Instruments)**
- **Sensations**

- **Sep**
- **Acco Sep**
- **Adm**
- **(over)**
- **(for)**
- **(each)**
- **(several)**
- **(R)**
- **(Rs)**

- **VERBAL**
- **General**
- **Specific**
FACTORs AFFECTING FEEDBACK

Organismic Factors Affecting KR

a) Intelligence and KR. Vernon (1962) observed that intelligence positively correlates with learning. But in most studies it was found that there is a very low correlation between intelligence and KR. Mohan and Malhotra (1974) found that the dull subjects performed better than average intelligent and bright children. Further they say that this might have happened because the initial performance of the dull subjects was lower which left scope for greater improvement. Mohan and Dharmani (1975) found similar trend with verbal conditioning.

b) Personality and KR. The concept of personality has been variously defined and it has been understood differently by different psychologists. A few personality theories have led to experimental studies with conditionability, performance, learning and academic achievement. One such theory of Eysenck, (1947, 1957, 1967, 1971) can be taken as an example and speculate the influence of Extraversion/Introversion (E/I) and Neuroticism (N) on learning when reinforcement is given in the form of KR. According to Eysenck (1947, 1957, 1967, 1971) the E/I dimension is related to the individual
differences in cortical arousal (excitation) and inhibition. Introverts condition learn better because they arouse quickly and accumulate slowly with inhibition, but its faster dissipation in contrast to extraverts in whose case the reverse happens. On the effect of praise and blame Thomson and Manniesut (1944), Ames (1965) suggest that there is an improvement in the performance of bemed extraverts as compared to the bemed introverts. With introverts praise seemed to work better. As the introverts are particularly susceptible to punishment or the omission of anticipated reward, it was understandable. Gray (1970) also found similar effects. The introverts under such condition would develop aversive conditioned response to a greater extent than the extraverts.

The above studies indicate that introverts are somewhat superior in performance in different tasks when RH was administered. A discussion failed to yield any consistent trend. This failure is due to the differences in the task difficulty considering the variability in the range of tasks used, and which is supposed to be another important factor which affects the functioning of RH. This factor is called as task specificity.
Vidhu Mohan conducted some studies in which subjects were classified into personality groups based on E/I and N dimension, and a learning situation was provided where K& could be extrinsically given. The facilitative effects of K& was confirmed. Mostly in all these studies (Mohan 1969 a, Mohan and Saol 1970, Mohan and Gupta 1972, Mohan 1973, Mohan and Kumar 1973, Mohan and Malhotra 1974, Mohan and Singara in press) where tasks like time estimation, line estimation, backward alphabet writing, tone discrimination and paired associate learning respectively were used, it was found that the interactive effect of personality and K& was the only a trend and not significant. (Fremont, Theodore; Means, Gladys H; and Means, Robert S). (1970) found significant differences on the treatment (feedback information) and the extravert introvert dimensions. A significant interactive effect was also observed. Islo-shola, Seppo (1976) observed that initial failure was observed under low-age involving conditions, thereby suggesting that the effects of dissonance and age involvement are interdependent. Layne and Ally (1980) found that the accuracy of interpretations related most simply to their acceptance and subjects changed their self-perceptions in the direction of the interpretations. McFarlin, and
Blascovich (1981) found that subjects with high or low chronic levels of self-esteem perceived ability for future performance in a manner consistent with their chronic levels of self-esteem rather than consistent with a feedback on correct performance.

**Task Specificity and KR**

Generalisations made regarding the effect of KR must be conditional depending upon the nature of task. Dunscombe (1964) reports that "each learning task requires its own specific ability". Lack of relationship might be due to the differential difficulty level of different tasks which in turn results in a wide range — from little improvement to nearly 100% of improvement with KR. Mohan (1969) using line estimation and time estimation found insignificant correlation between two acquisition rates. Mohan (1969, 1973) found for line estimation the rates ranged from 17% to 23%, for weight estimation the rates were all the way from 24% in children (Mohan and Gupta (1972) to about 56% in adult sample (Mohan and Desral (1971)); Mohan and Dey (1964) Mohan (1969) and Mohan and Sekhon (1972) found for time estimation the acquisition rates ranged from 42% to 52%. Mohan (1969) suggests that performance improvement with KR on one task may not be the same as that on another.
Experimental Factors of KR

Ample evidence is available to show that the more the KR given the better and faster is the learning. Research work of Admones (1936); Bilodeau and Bilodeau (1956); McGuigan (1959); Madan and Bey (1964); Mohan and Deol (1970); Mohan and Damral (1971) have supported the above generalisation. Lorraine (1970) found the 50% KR group took longer to reach criterion than 100% group while studying the effect of percentage of KR and associability of items in acquisition and extinction of paired-associates. Mohan and Shingara (in press) found in the study of paired-associate learning that 66% KR group gained an edge over 33% KR group by the 30th trial. Gansu, (1975, 1976) found that KR plays a reinforcing role in the development of competence, less through precision which it furnishes than through the frequency of knowledge of a correct response.

A few studies have reported a failure of differential effect of frequency of KR. Goldstein and Rittenhouse (1954) have found that there is no difference between 50% and 100% KR schedule. McCormack et al (1963) observed that there is no dependable change in reaction time when 30%, 50%, 70% and 100% KR was given. Mohan and Mann (1970) found no significant differences in the performance on choice reaction time when 25%, 50% to 75%
KR was given. Some investigators observed that withdrawal of KR did not necessarily lead to extinction, but it led to continued increase of response strength in paired-associate learning (Richardson, 1958; Eison and Zeaman, 1963; Richardson and Grapper, 1964); Hassel and Grassnickle (1965) hypothesized that when uncertainty is greater in paired associate learning, the information contained in the KR is also greater, and hence the amount of learning is also greater.

**Precision of KR**

Performance depends upon the amount of reward given. Ammons (1956) suggested that performance would be better if more information is contained in KR. In other words there would be more rapid improvement if KR is more precise. In studies of line drawing experiment Trowbridge and Gason (1932) divided the subjects into 3 groups -- no KR, KR in terms of right and wrong, and KR in terms of exact magnitude of discrepancy from the standard line of 3 inches. They found that the group which was given exact information surpassed in performance, to the other two groups.

Estes (1967) found greater effectiveness of saying "right" after a response saying "wrong". Ziegler and Paul (1962) found that praise to be more reinforcing than correct reinforcers with small class children whereas
reverse was true in case of middle school children. Negative comments were a few times useful in establishing conditions under which praise would be more effective (Alister et al., 1969).

Jones (1968) found with verbal learning such as paired-associate learning, there was a maximum improvement in performance when feedback consisted of the correct stimulus and response.

An optimum precision of KR beyond which additional KR would lead to no further improvement (Ammons, 1956). Erdos (1960) found that precise feedback is more effective in reducing frame-dependence than general feedback.

**Delay of KR**

Time lapse between the execution of the response and the receipt of information is known as delay of KR. In human learning and animal conditioning delay of rewards has more or less similar effects. Learning is optimal in instrumental conditioning if the reinforcement follows immediately upon the response. Ammons (1956) found that the longer the delay the less effective was the KR. Sax (1960) observed that with longer delays more trials were necessary to reach the criterion of associating characteristics of Chinese symbols with nonsense syllables. In studying the
varying interval between performance of a perceptual-motor task and KR. Dyal, Wilson and Berry (1965) found the immediate KR group to be superior and in line drawing skill the delay in KR interfered (Dyal 1964). Hassig and King (1968) found that under delayed auditory feedback (DAF) high anxious subjects read significantly faster than low anxious subjects, although no time difference was found for immediate auditory feedback (IAF) presentation. In paired associate learning immediate KR seemed to be superior to performance under delayed KR (Wright and Geshedar, 1970).

A series of experiments were conducted, using a wide variety of tasks in which delay of feedback and reward during learning was related to improved retention. Henderson (8677) (May) found that effect of delayed visual feedback (VF) is attributed to the failure to integrate visual information with the fading proprioceptive. Martel and Whissell (1979) found significant DAF effects appeared only when the DAF condition was completed by subjects before the non-DAF condition.

The effect of delay of KR or any other form of reinforcement is determined by the nature of the experiment, tasks used and conditions manipulated.
Distribution of Practice and KR

The amount of interval which is interposed among the trials given on task is known as distribution of practice. Conversely when the amount of interval is relatively inappreciable the term massed practice is applied. Mohan and Damral (1971) reported that time interval between two trials effects learning with KR, but the trends are inconclusive. The effects of distribution of practice on performance are controversial. Some investigators (Amons, 1956) reported massing of practice to be facilitative in performance in motor task while Mohan and Day (1964) observed that spacing of trials to yield somewhat better results in line estimations when KR was administered. In task of weight estimation no significant difference was found between massed and distributed practice. Results showed that when spacing of practice was combined with 100% KR, the performance was significantly better than massed practice with 33% KR (Mohan and Damral 1971).

Induced Motivation and KR

KR has the inherent motivational property with induced motivation through verbal instructions, producing ego involvement which facilitates the performance (Mohan and Damral, 1971). Brown (1961)
remarks “Performance levels can be changed if S is told that the task is important or unimportant, verbal instructions may modify performance either by virtue of their cue properties and the resulting changes in associative strengths or in both ways”. When reward (motivation) was coupled with KR, it produced highest level of performance (Raymond et al 1962). Similarly when high induced motivation was coupled with KR in weight estimation, the acquisition rates were significantly higher in adult samples (Mohan and Desral 1971). The function of induced motivation with KR is reversed with children of different personality make-up (Mohan and Gupta 1972). If drive exceeds an optimum, it starts having adverse effects (Madan, 1967). Lee (1976) observed that subjective probability induced by normative feedback mediates performance via an experimentally produced motive like orientation.

Interactive effects of KR

Jones and Bourne (1964) conducted a series of five experiments using a verbal maze, they observed no reliable difference in performance between 0 and 6 sec delay in the first two experiments. Lengths of IF delay (0, 3 and 6 sec ) and of post-IF interval ( 0, 3 and 6 sec ) were combined factorially which employed a paired-associate task. Performance improved with increases in both intervals
and the effects were additive. Interpolation of a task-relevant activity during IF delay using a trials delay technique was studied in other two experiments. Results in the first experiment in which IF was given in the form of the correct S-R pair, suggested no effect due to delay. In the other experiment however, with IF in the form of response members only performance declined with increasing delay. Results were interpreted in terms of the molecular variables underlying delay of IF. Averback (1973) found that differential feedback information was a significant determinant of change in A-state. With failure feedback inducing greater increase in A-state than either no feedback or success feedback. Roberts (1974) observed that the level of subjective confidence was closely related to both in-program and post-test performance, but was not affected significantly by variations in the type of feedback. Arnold (1976) indicates that extrinsic rewards either did not affect or enhance intrinsic motivation. Feedback on task performance had a potent impact upon feelings of competence and hence intrinsic motivation. Adelman (1977) reported that with information about the formal task properties, the level of achievement with outcome feedback was as high as that with cognition feedback. Allen and Clark (1979) observed that the feedgroup showed
a decreasing Weber-fraction during the estimation phase, while the Weber-fraction for the no-feedback group increased. Sharit (1969) found that most positive effect was produced by the highest feedback and the least positive effect by the lowest feedback. Elam (1974) designed a study to investigate the effects of immediate and delayed feedback on learner's retention when instruction is provided prior to a response and feedback and when no prior instructions was presented. Two forms of feedback, the correct answer plus information stating why it was correct, were employed. Results of this study showed that there is response facilitation in the paired associate task but in concept learning tasks.

4 EFFECTS OF FEEDBACK ON LEARNING

Foot and Lee (1970) observed that (a) reinforcement through evaluation of own performance with social norms, significantly increased the rate of learning and (b) motivation through an audience effect which increased the general level of performance. Titus (1973) found that feedback improved recognition performance by significantly reducing the number of false alarm errors. Hendrix (1975) observed that
providing subjects with feed forward information generally did not improve their performance. Providing subjects with feedback did have an effect. Castellan and Swaine (1977) reported that different types of feedback tended to produce different response strategies. There was an apparent interaction between task characteristics and feedback type. Sinanath and Reddy (1976) in their experimental study on different feedback methods observed that the intermittent feedback was the most effective one as against the visual presentations of correct answers and the discussion of wrong answers at the end of sessions. Simak and O'Brin (1978) obtained that by providing immediate feedback of the inappropriate movement resulted in a statistically significant increase in the number of puts halted. Lassle; Bairstow; and Baker (1979) found that practice increased reliance on feedback while performance in the absence of sensory information declined. Beck and Lindsey (1979) reported that significant and similar gains were made by both groups, indicating that the timing of feedback is not an important factor. Hayes and Reeve (1980) observed that typists at different skill levels use visual feedback similarly with the best overall performance occurring when visual feedback is available
and used for response guidance. Weber (1980) found that ideal feedback metering is necessary for automobile.
Tuckman and Yates (1980) found that subjects receiving feedback changed significantly more in subsequent student ratings on each of the 5 dimensions than subjects not receiving feedback. (The degree of change by feedback recipients was substantial relative to their own ratings of the ideal teacher). Adelman (1981) observed that relative effectiveness of outcome and cognitive feedback depends on formal substantive, and contextual task properties. Christina and Anson (1981) reported that learning of a programme-based process is a gradually acquired freedom from visual feedback and that a programme-based process can be learned independent of a feedback-based process. Hoffman; Ha-rie; and Slovic (1981) found that appropriate feedback might enable people to learn for more complex functional relationships than have been thought possible. Talkingtown, Altman; and Grinnell; (1971) observed that with negative feedback subjects outperformed those only with positive feedback. Vasta; Whitehurst; and Borokowski (1974) observed that all 4 feedback groups (positive, negative, positive and negative, and negative with correction) were more accurate than control group (no-feedback). The negative with correction condition resulted in greater accuracy.
all the groups including the control improved significantly over trials. Schonell and Hewell (1976) found that subjects actively operate upon the knowledge of results (KR) they receive through the motivational functions of KR plus verbal instructions of ego-involvement type, the performance is likely to deteriorate.

**KR as applied to life**

The facilitative function of KR is not merely applicable to laboratory situations. In different fields of life and for improvement of behaviour, KR has made a remarkable importance in the learning process. KR's role in educational set up and for therapeutic purposes are noteworthy.

**KR and Academic Achievement**

The problem of motivating younger children to do their best in classrooms, has become the most challenging task for the teacher. Incentives used in laboratory experiments will not suffice the purpose. The biological needs and gratification looses its meaning in the classroom situations. The primary learnt sociogenic needs may govern the actions of children in the classroom. Reinforcement given so far to the children are quite inadequate, and hence the result would be, achievement of the children may
dwindle, not because of sloth but because of lack of proper motivation. Lack of motivation is responsible for under-achievement (Staats and Staats 1963, 1964). Over achievers are better motivated and more organized (Oakland, 1969). Under such circumstances the aid of KR can be taken in order to make learning situation more meaningful, and also to correct the errors side by side. Administration of tests etc. becomes meaningful unless and until children are given immediate KR of where and how they have committed errors. Declaring results of the examination after a lapse of time, vitiates the basic purpose of testing. Revision of lessons with the aid of KR would be more profitable in everyday class teaching, by which it gives direction to the learning, and at the same time it keeps children to be alert and involved in their work.

KR and Bio-feedback Therapy

Bio-feedback is a recent addition to the psychotherapeutic devices. By informing the individual about certain functions of his body, he can be made to control them. Joseph Kamiya (1958) observed that when feedback was given in the form of a sound, subjects learned to decipher between the Alpha and non-Alpha waves, and they could also control them. Later, he also
found that the process of biofeedback could be speeded up by sounding the tone along the Alpha-waves. These findings were confirmed by Norvick (1970).

The technique has opened new doors for curing the psychosomatic disorders where the control of visceral functions could be learnt. Under the control of autonomic nervous system these functions relate messages through the ascending-reticular formation to the brain. They are also voluntary and hence could be changed and altered through the biofeedback technique.

Feedback in team training

The feedback or knowledge of results training variable becomes very complex and powerful in a team training situation. Rosenberg and Hall (1958) have pointed out, the way in which feedback is handled in the team situation may often be the key to the actual communication structure of the team.

Of course, the primary difficulty in a team situation is whether you provide a team member with information about (a) his own performance only, (b) team performance only, or (c) both his own and team performance.

Knowledge of results about one's own performance may tend to produce behaviour which is self rather than team oriented. The team member may become too enamoured with his own skill and not worry about the
success of the team effort. On the other hand, there are certain problems involved in only providing team members with information about team performance, particularly when team performance is some composite of the performance of all team members. The reason for the difficulty is that under team feedback conditions an individual team member gets very little direct information about his own performance. Since we established earlier that ER is an essential ingredient to learning it may be very hard for team members to learn under team feedback conditions.

Rosenberg and Hall have conducted several studies on this problem of feedback (1958). They have found individual performance to be tremendously affected by the kind of ER team members are given. Under conditions of feedback (they used the term “confounded feedback”) the team members seemed to develop compensatory behaviour. That is, if one team member was an “over responder”, then the other team member would become an “under responder”. The interesting finding was that confounded feedback did not result in less accurate performance as compared to an individual feedback condition.

The above three examples are the glimpses which accrue through the usage of ER in our everyday life. Perhaps it might be the opening of new horizons for better and more efficient learning in human beings.