

B.A. (Hons) Part-III
Psychology Paper-VII

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Scope and Importance of Industrial Psychology**Lesson Structure**

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1.0 Objective

The main objective of this lesson is to make the learners stand nature, definition, scopes, aims and importance of industrial Psychology.

The above noted points will be explained one-by-one under separate heading. To assimilate the discussion, a summary is presented. Key words used in this lesson are also noted in a heading. To check the understanding of the lesson different types of questions are (objective, short, long) given for exercise, lastly to understand the lesson more clearly some books are recommended for suggested readings.

1.1 Introduction

Industrial Psychology is a branch of Psychology traced in the beginning of 20th century. It developed as separate branch during 1930—1940. It is an applied branch of Psychology. The knowl-

edge of this paper can be applied in the field of industry.

Different psychologists have defined industrial psychology differently. A definition given by Harrells (1964) "Industrial Psychology is simply the application of extension of psychological facts and principles to the problems concerning human beings operating within the context of business and industry".

This definition suggests that in this branch human problems are studied in the context of problems and relations, between two or more workers, problems of manager executives and workers. Other problems like motivations and needs of the workers are solved by applying principles and theories. Psychologists study only the problems originating in the industrial organisations.

Blum and Naylor (1964) have given appropriate definition emphasizing the use of psychological principles and facts in industrial organization or industry.

They explained that "Industrial Psychology is the application or extension of psychological facts and principles to the problems concerning human beings operating within the context of business and industry".

Supporting the ideas given by Blum and Naylor, Schultz and Schultz (1990) have given the following definition, "Industrial Psychology is the application of the methods facts and principles of psychology to people at work." The main points discussed in this definition are :

1. Industrial psychology is that branch of Psychology which studies human problems originating within industries and business. Human problems are of various types e.g. Motivation, morale, job-satisfaction etc. An industrial psychologist studies the problem of motives-increase in wages, comforts, social recognition and promotion of higher posts. Among all types of motives psychologists find out which one will promote industrial production most.

In another way it can be said that motive attached to worker, increases the production level and amount. Morale is something which is related to motivation it is mental energy or encouragement of the worker to the work with all their effort. Job satisfaction refers to whether the workers are satisfied with their work or not. The industrial psychologists study the theories and principles related to job satisfaction.

2. The branch studies only those workers who are engaged in any industry.
3. The branch analyses the facts and principles for solving the problems related to worker and industry. Problems of a worker are related to three areas given below :
 - (i) The workers tend to differ with each other in their intelligence aptitude, interest and personality traits. During the course of their selection a psychologist applies different types of tests to evaluate for a worker that what type of work is best suited for a person. At the time of promotion they do the same work to see whether they are fit for promotion or not.
 - (ii) Industrial psychologists study man-machine relation and their system, suggests which

type of design and shape of machine will be best suited to the workers that whether the design will increase productivity and decrease discomfort of the workers. Besides, studies are also made of the physical environment such as illumination, temperature, sound, colour of wall, humidity etc.

3. Lastly, a psychologist also works for the problems of human relations, conflicts, frustrations, disputes and tension among the workers, workers and officers in the managerial part.

1.2 Main Theme

1.2.1 Scope of Industrial Psychology

The above section about definition lead us to conclude that industrial psychologists study the problems of workers and tries to solve the basic problems operating in the field of industry. Many psychologists have studied in different area and they have presented a brief description of their area.

Taft (1946) and Stagner (1957) have categorically stated that industrial psychologists are related to their work area. Mc Collom (1959) described 75 different areas of different psychologists. The description have gone under several revisions and finally 14 areas are found important. The American Psychological Association (APA) consists of many divisions in which 14 have been made for industrial Psychology. The following work areas have been described with which industrial psychologists deal :

1. Personal Selection : It means that labourers and workers are selected according to the requirements of the work (job). For this selection analysis of job requirement and job selection is done. This process is known as job analysis. For the selection procedure a psychologist uses and administers different types of tests e.g. intelligence, personality and aptitude test are used. The psychologists also evaluate that an employee should get a job according to his abilities, interests and aptitude.

2. Personal Development : The industrial psychologists help workers or labourers for a full mental and personality development by opening a school for making the attitudes training favourable, develop learning habits and adjusting with their group members, and relatives. The assessment of the worker's performance is also done by industrial psychologists.

3. Human Engineering : It mean that the industrial psychologists design the machines and other apparatus and tools in such a way, that labourers or workers can work with interest and are less fatigued in their work, such efforts can be done to improve the quality and quantity of the production. Thus, engineer's and psychologists combined devices and designs the machines best suited from the point of view of a workers and industry.

4. Management : The industrial psychologists are concerned with the administration and management in an industry. The psychologist look for the discipline in a factory, whether they go for strike or not. They find out the cause of devise and strike the solution (ending the strike). The psychologists give training to managers and supervisors also.

5. Counselling : A counselling is also provided by the counsellors to the workers, supervisors and managers for their emotional problems such as lack of interest in the work.

6. Public Relation Research : Apart from the above said work the psychologist looks after the welfare of the workers and other general interests e.g. amount of compensation to be given to a worker in case he becomes the victim of an accident. He helps in the proper treatment of a worker, handles the emotional problems after the accident.

7. Market Research : It aims to search out the needs of public as regards the products. (Things made by the factory) and bring change in the quality of the products. Changes are made in the quality of the product in accordance with the demand of the people. Suitable changes are in the interest of both the factory and for the people.

8. Study of job Analysis : It refers to the suitability of the job as per the interest of a worker e.g. finding or searching out the interest, abilities and special aptitude etc. Matching of job will be done according to the interest of workers.

9. Miscellaneous Works : In the case of accidents or mishappenings he tries to find out the cause and find the solution to prevent such types of accidents in future. To raise the standard of work, loan given to workers without interest revised pay scales from time to time, and frequent mental and physical check-up of the workers.

Thus, the important areas to which industrial psychologists work is for the better output and welfare of an industry. Some of the Indian industrial psychologists contributed in the area of industrial psychology. The work of Sinha, Ganguly, H.C. Kandhole, P.N etc are important in Indian context. Apart from the areas related to it some other aims of industrial psychology are mentioned below :

1. It aims at solving the problems in an organisation— problem may be personal, social and psychological.
2. Scientific selection is done with the help of tests (Intelligence + Personality).
3. It provide them training for better quality and quantity of the work.
4. To make arrangement for the check up of mental health (depression, anxiety etc.). They provide counselling.
5. The psychologists boost up the moral of the workers.
6. They try to increase the motivational level of the workers.
7. Psychologists do all its effort to raise the production level in an industry.

1.2.2 Importance of Industrial Psychology

Blum and Naylor (1984) said that industrial psychologists are very useful to the employees, industrialists and to the general public. They do a lot of work for the benefit of factories and industries; tries to remove their problems and suggest best for better output.

Out of seven or eight areas the industrial psychologist are involved the following four areas are of major significance.

1. Absenteeism : This fact is to be searched and explain by the psychologists. It means why the workers do not turn for the work, go for strike, and stay at home for various reasons, To find out the various causes of absenteeism among workers. They also tries to find out the cause of solution for the absenteeism. It is obvious that worker's absenteeism can cause great loss (personal + social). It can also serve as national loss. Cascio (1984) found that removal of absenteeism can save 1000 dollar in a year, Schultz and Schultz (1990) found in a Canada Bank (where 30 thousand employees are working) 7 million dollars was saved in a year by removing absenteeism and the removal happened by following the measures recommended by the industrial psychologists.

2. Labour Turn Over : It refers to leaving the work voluntarily to work in another factory for their earning. For checking labour turn over psychologists administer different types of tests to employees and with the help of these tests employee's capacities, interests and aptitudes are determined in accordance with the job so that he can adjust well. Apart from reducing possibility of turn over, psychologists also suggest proper wages and other benefits of particular type of work. If labour turn over is taking place in factory, the huge amount of money is wasted. A report by Blum and Naylor indicate that only 10% removal of labour has resulted in the loss of 1 lakh dollar in a year.

3. Job satisfaction : A worker is satisfied with a work he is doing and the wages and allowances he get. Job satisfaction does not mean only monetary gain, rather it refers to other facilities also e.g. recognition and other promotional benefits given to him. If a worker is satisfied it means that the job satisfaction has been achieved. Evidently if a person is satisfied with his job the problems of absenteeism and labour turnover will not arise. Schultz & Schultz (1951) have reported that in a big company 1.25 lakh dollar was saved only in a year by removing absenteeism and labour turn over, which have very high likelihood to happen if the workers remain unsatisfied.

4. Personnel Selection : Personnel selection refers to selection of suitable worker for a particular job and to do this particular work the psychologists administers different types of ability, aptitude and personality tests, so that a suitable employee for the requirement of a particular job is selected. He may select an employee by interviewing them, if necessary, for a particular type of job.

Cascio (1984) said that apart from the intelligence and personality tests, Psychologists use cognitive and mental ability tests for making the selection more appropriate and scientific. Adler (1981) compared the assessment centered interview and found that performance of those workers was good who are selected on the basis of this assessment technique yielding additional advantage of more than a thousand dollar. It means that assessment interview is superior than the general interview. Hunter, et al (1982) found that the proper selection technique resulted in a great saving.

Apart from this, the psychologists keeps the moral of workers high to boost up motivational level of the workers. Thus, the area of industrial psychologists have wide range from deciding place, capacity of work, pay scales, solution of the problem and their adjustment.

1.2.3 Conclusion

We can conclude the whole discussion in the following way. The industrial psychologists play a very importance role in an industry. An industrial psychologist solves the problem related to employees which is operating within the context of industry. Problems in an industry are of various types e.g. workers and labourers, industrialists and managers. There are a lot of conflicts between such workers. The industrial psychologist tries to solve the problem as far-as-possible. In this way a psychologists maintains a balance between officers and workers.

1.3 Summary

We can summarize the above lesson on the basis of the following points.

1. Industrial psychology is a very old branch of Psychology emerg as a separate branch during 1930-1940.
2. It is an applied branch of Psychology.
3. It is that branch of Psychology which studies human problems within industries and business.
4. It is related to motivational level of the workers.
5. It is concerned with the morale and job satisfaction of the workers.
6. It is concerned with the problems of wages and conflicts and promotion of the workers.
7. The work areas (scope) are personal selection, personality development, human engineering, management, counselling, public relation research, marketing and study of job analysis.
8. It has the following important areas that can affect the work of an industry—absenteeism, labour turn over, job satisfaction and personal selection.
9. All the above factors can be solved in an industry and business with the help of clinical psychologists.

1.4 Key words

- | | | | |
|-----------------------------|--------------------------|-------------------|-------------------------|
| (i) Applied branch | (ii) Executives | (iii) Workers | (iv) Motivation |
| (v) Morale | (vi) Job Satisfaction | (vii) Wages | (viii) Recognition |
| (ix) Aptitude | (x) Personality traits | (xi) Productivity | (xii) Conflicts |
| (xiii) Managerial | (xiv) Personal selection | (xv) Turn over | (xvi) Job analysis |
| (xvii) Management | (xix) Counselling | (xx) Absenteeism | (xxi) Human engineering |
| (xxii) Personal development | | | |

1.5 Questions for Exercise

(a) Objective Questions

1. Industrial psychology emerged as a new branch in —
 - (a) late 19th century
 - (b) 18th century
 - (c) early 20th century
 - (d) late 20th century

(b) Short Answer Type Questions

1. Define industrial psychology and explain its subject matter.
For Answer see 4.1
2. Discuss the scope of industrial Psychology.
For Answer see 1.2.1

(c) Long Answer Type Questions

1. Discuss the importance of industrial psychology in an industry.
2. Explain briefly the scope of industrial psychologists.
3. Write notes on
 - (a) Aims of industrial psychology.
 - (b) Definition of industrial psychology

1.6 Suggested Readings

1. Blum & Naylor — Industrial Psychology
2. Schultz — Industrial Psychology
3. Tiffin — Industrial Psychology



Physical Environment of Work**Lesson Structure**

- 2.0 Objective
- 2.1 Introduction
- 2.2 Main Theme (Physical Environmental Work)
 - 2.2.1 Illumination
 - (a) Intensity of light
 - (b) Distribution of light
 - (c) Colour of light
 - 2.2.2 Atmospheric Condition
 - (a) Cold Temperature
 - (b) Humidity
 - 2.2.3 Movement of Air or Ventilation
 - (a) Effect of ventilation on mental work
 - 2.2.4 Noise
 - (a) Effect of noise on performance
 - (b) Effect of noise on morale of the subject
 - 2.2.5 Conclusion
- 2.3 Summary
- 2.4 Key Words
- 2.5 Questions for the Exercise
 - (a) Objective Questions
 - (b) Short Answer Type Questions
 - (c) Long Answer Type Questions
- 2.6 Suggested Readings

2.0 Objective

The objective of this lesson is to make the lessons fully about the physical environment at work. We shall examine various factors associated with physical environment e.g. illumination and factors associated with it (intensity, distribution & colour), Atmospheric conditions and factors (cold, tem-

perature and humidity), movement and ventilation and factors (Effect of ventilation or mental work), noise and associated facts (Effect of noise on performance and morale).

Finally, to assimilate the discussion a summary is presented, key words used in this lesson are given and to check the understanding of the lesson different type of questions (objective, short, long) are given for exercise. Lastly, for more clear understanding of the lesson some books are referred in suggested readings.

2.1 Introduction

Generally, a physical environment refers to the environment created by such factors as design of the factory, facility of parking, proper illumination, proper atmospheric conditions and temperature etc., colour of walls, noise level and working environment. The above said factors can affect the quality and quantity of the production.

Where the social environment means the environment created by the persons working in a area e.g. labourers, workers, managers and others. Factors that influence standard of quality of production are illumination, atmospheric conditions, temperature- humidity, ventilation or movement, level of noise, music and colour of the walls.

There are factors other than physical environment, time, motion, selection of the workers, efficiency of worker, but the physical environment is more important for the quality and quantity of work. Changes in physical environment can bring changes to integral aspects of work. In fact, external aspect of environment such as temperature, illumination are known as physical environment.

2.2 Main Theme

2.2.1 Illumination

Illumination is the most important factor within a physical environment as it exert direct effect upon production. It can also influence the quality and quantity of production. There are three important factors of illumination— those are intensity of illumination, distribution of illumination and colour of illumination.

(a) Intensity of light : Among the above said factors, intensity is the most important factor because it is related with our vision. Our visual activity increases with an increase in intensity of illumination. It means that if there is more light the workers visual activity increases and he can see more clearly.

The intensity of light can be measured with a foot candle. One foot candle is a standard candle kept at a distance and its level of light equals 100 wt. bulb kept in a dark room at a height of 10 feet. The studies have shown that at 100 feet candle the visual activity comes at par with visual activity found in days light.

The intensity of light required for all works varies e.g. a more intense light is required in such

type of work which we have to see in minute details, as for example — assembling of computer parts, organizing parts of a watch, T.V. set and Radio etc. If it requires 2000 foot candle for joining the parts, the aeroplane parts requires only 20 foot candle for office varandah.

Some scientists have also found (Ferre & Rend (1940) for their studies that there also exists individual differences in regard to intensity of light, as for example — 70% individuals require light as much as produced by 15 foot candle in reading material printed with the help of 10 point, while 30% said that they require only so much light as produced by 11.3 foot candle in reading the same materials. The main factor is working behind the requirement of light is age factor. Workers above the age of 35 require more light than those below this age. Besides this, defect in eye and individual difference are also important.

A study conducted by Hawthorn shows that the result produced by physical environment emphasize the attitude of workers with regard to change made in physical environment made for that purpose only by the managers. Results indicate that workers perceived the changes done by the manages for their own benefits in production, there would not be much benefit in production because they would not react so favourably to such changes. Contrary to this, they react much favourably to the changes made for their comfort and that would increase their production.

(b) Distribution of lights : Not only the proper intensity of light but distribution of light among workers is also very important factor. It means that distribution of light in a factory should be equally distributed so that each worker can feel that they have proper light and they do not have. If the light is not properly distributed it would produce dazzle in eyes which may cause tension to a worker and that factor may reduce the production.

Thus, the direct or indirect glare of light and their distribution may decrease the production a study by Schultz & Schultz (1990) has shown that whatever glare is caused production tends to decrease in only 20 minutes. Blum & Naylor, however, suggested that best way to decrease glare is to use a translucent bowls. This will remove both types of glare caused from direct or indirect lightening. It is suggested that the indirect light is superior than the direct light. The main cause is that in this type of lighting the light does not fall on the eyes of the worker and at the same time it is equally distributed in the work area. Another study by Gray (1978) shows that group that does Reading Test in indirect light have fever error than those have Reading Test in direct light.

Another problem in the distribution of light is shadow, which is generally produced by objects which are not properly kept in the work area. Studies have shown that shadow produced in the work area diminishes the production to a some extent. The shadow creates a kind of unpleasant feeling among the workers. They feel depressed in such a situation. The distribution of light include the following important points :

1. The distribution of light should be such that no glare, direct or indirect, is caused.
2. For removing glare, the light should be indirect and not direct. It would be better to keep a semi-direct light because it will be tolerable to a certain degree and at the same it will not

be too costly.

3. The work area should be free from shadows because shadow could produce emotional disturbances in some workers which lead to negative attitude in them.

(c) Colour of the light : It is always experienced that writing and studying in a day light is easy and rapid. It has been proved by experiments that day light is the most appropriate light and next to this, which approximates the light is good for working. It has been also found that visual activity is highest during day light because workers can found more rapidly the defects of clothes Fernberger et al (1934).

In another study by Ferre and Rand (1940) that Reading Tests in three conditions :

Condition I : Mercury lamp (having shortest wave length, as colour of the light depends upon wave length) which is producing yellow light.

Condition II : Sodium lamp (having medium wave length) which is producing yellow light.

Condition III : Fluorescent lamp having higher wave length, Producing mixed yellow colour light, which approximates very much to day light.

When compared these findings, reading test was accurate in the third condition and less accurate in the first condition. The efficiency of the colour is yellow colour light. Apart from colour of light, colour contrast is also an important factor e.g. black-white and black-yellow are favourable conditions of working, it creates good feeling among workers, which result in efficiency.

2.2.2 Atmospheric condition

By atmospheric condition we mean air, temperature, humidity and movement influence the quality and quantity of production.

As far as air is concerned, the pure air consists of :

1. Oxygen — 20.93%
2. Nitrogen — 79.04%
3. Carbondioxide — 0.09%

The above noted percentage is right proportion of air and if there is any change in such proportion will definitely cause breathing difficulty. In such a case production will naturally fall.

The other important point related to air is that if more than a person is working in a room that must be big and airy, otherwise there will be difficulty in breathing, suffocation and sweating will result fall in production.

The important dimensions responsible for production of the workers are :

1. Temperature
2. Humidity
3. Ventilation or movement of the air

Temperature is a very important factor related to production in a factory. The human body maintains a constant temperature through special process, whether it is hot season or winter season.

The optimal temperature of the body is 98.6° F and for a room in summer season should be 65° - 70° F and 69° to 73° F in Winter Season. If the working condition in a factory is optimal it gives the worker a pleasant feeling and the quantity and quality of the product will increase. The temperature has also two aspects— hot and cold. In a study Mackworth (1950) found that when the temperature increases from 79°F to 97°F error in working increases. In another study it was also found that as compared to 70°F, the errors are found to increase in 95°F, the latter temperature is of experimental group, where as the former is of control group. Similar studies has been done by Fine et al (1978), Pepler (1953) and Wing (1965). The limits of above range is such in which persons can do work easily.

(a) Cold Temperature : It has been found by studies that cold temperature as well as hot temperature is responsible for physical and mental work. Clark (1961), found on the basis of his studies that skin temperature is very important during physical work (From 55°F to 70° F is critical temperature where more error occurs). However, studies have not shown adverse effect on mental work. In this connection individual difference, age, sex and health are important.

(b) Humidity : Humidity is also an important factor, which can influence performance of the workers. The ideal range of humidity is 25%—50%, which results in good production, Schultz & Schultz (1990) found that upon 140° F temp, moisture level is only 10% which has no bad effect on production in this case. There occurs a combined effect of temperature and humidity and work. If the humidity goes upto 80% then the production goes down.

With regard to mental work Fine et al (1978) compared high and low humidity and found that more errors are found in between 35% — 85%, while the work (mental work) was better in between 21%—25% humidity level.

2.2.3 Movement of Air or Ventilation

It means that air is not stagnant, rather it is moving. It is also evident that one can read well when the fan is fanning (moving). The only cause behind this is that pure air comes from outside and dirty or hot air moves outside. This process goes on till the fan is moving. The work as well as production in this case will improve while, in a stagnate air sweating will cause and result in decrease in production and unpleasantness.

A study by New York Ventilation Commission is remarkable. Maximum production was recorded in 68°F temperature when fan was moving. The production went down to 89% when fan was off. In the case of 75°F with fan off, the production goes 14.8% down.

They have also suggested that good environment with fan on increases production up to 24%.

(a) Effect of ventilation on mental work : With regard to mental work ventilation has surprising result. An ideal condition is 68°F and 50% humidity. The work efficiency decreases as both the conditions increases.

2.2.4 Noise

Noise is a disturbing element. It is difficult to read in a noisy condition. The scientific study is not

direct and simple. Noise is of two types :

1. Constant noise
2. Intermittent noise

Apart from this attitude of the worker is important. Scientific studies suggest that constant noise is more disturbing than intermittent noise. Apart from this, the study suggests that there are individual differences in handling a noise. The zero db is threshold of hearing and 90 db is right of doing a work for a period of eight hours daily. If the work done in increased db sound work hour recedes (Culbert et al (1960).

Noise tends to produce three types of effect on individual :

1. Effect upon health.
2. Effect upon performance
3. Effect upon morale

Thus, the effect of noise has been immense on production in case sound increases. It affects normal blood supply, causes tension, feeling of uneasiness and even heart disease too. A study conducted by Gensteen et al (1976), shows that intensity of noise can also produce mental change such as emotional instability, irritability, aggressiveness etc. It can also produce temporary or permanent deafness, supported by trahiotis (1979).

(a) Effect of noise on performance : The effect of noise on performance has been studied, though it has no adverse effect on performance but it has adverse effect upon health. The worker has to put extra energy to work. The effect of noise however, depends upon individual difference and nature of work. A study by Koelga et al. Kom Hauser cial (1927), shown that performance of typist affected adversely by noise. If the hours of noisy period increases there is again decrease in performance. Mc Cartney (1941) found that the performance increases as the condition becomes peaceful, error will decrease 1/8 fraction or 24%.

(b) Effect of noise on morale of subject : Noise is an unpleasant condition and individual tries to get rid of this condition. The noise has also adverse effect upon physical and mental work. It product irritability and instability. The facility given to a worker must produce comfort and well being, so that it can produce good effect on worker. In such a case their morale is increased (Hawthorn) Intermittent noise has been found to increase emotional reactions and produce distraction in the worker. The morale of the worker can be increased by removing both types of noise.

In spite of all that findings with respect to noise is not consistent. The effect of noise has not been found to be good in any case for performance. Results related to the above fact is given below.

In case of continuous noise the workers tend to adapt by using a little more energy, so the performance is not much affected. When there is a change from noise to quiet condition, then there is decrease in production because the adaptation is disturbed. Ford (1929) has experimentally demonstrated that even in change to quiet situation has resulted in decrease in production.

Noise studies have produced different results depending upon the capacity of the individual to adapt in a particular working condition e.g. a typist adopt himself with the sound produced by a type -writer. In spite of all findings there is general agreement among psychologists that to work in a quiet condition is productive and encouraging to the workers. As Maier (1965) pointed out, " In general what the industrial studies agree is associated with some form of improvement by removing noise. Although an increase in production may be questionable in some cases, it is apparent that noise does not increase production".

2.2.5 Conclusion

On the basis of above discussions we can conclude :

That, the physical environment is essential aspect in an industry and business. It is created by design of the factory, parking facilities, illumination planning, proper atmospheric condition, temperature, colour of walls, noiseless working environment.

These are working environment that can affect quality and quantity of production in a factory. If done with a suitable physical environment, can satisfy mentally to the worker. They would feel emotionally free, no tension and conflict. On such a condition the production of the factory increases.

2.3 Summary

We can summarise the above discussion in the following way :

1. A good physical environment is essential for working in a factory.
2. It refers to factors with which we are surrounded e.g. air, noise, light, temperature, colour etc.
3. Social environment comprises the persons working in that factory e.g. worker, labourers, supervisors and managers.
4. Both the physical and social environment can influence the output of a factory.
5. Light (illumination) is a very important factor that can affect working of a worker. Light may influence due to its intensity, distribution and colour of light.
6. The other important physical environment for work is atmospheric condition which consists of air, temperature and humidity.
7. Movement of air or ventilation is important aspect of physical environment. It has great effect on physical and mental work.
8. The very important factor in factory is noise— may be continuous or intermittent. It has effect on production and morale of the workers.
9. Thus, a suitable physical environment in a factory increases production and decreases dissatisfaction.

2.4 Key Words

- | | | | |
|--------------------|----------------------|-------------------|------------------------------|
| (i) Glare | (ii) Illumination | (iii) Foot candle | (iv) Physical environment |
| (v) Dazzle | (vi) Visual activity | (vii) Wavelength | (viii) Atmospheric condition |
| (ix) Production | (x) Output | (xi) Temperature | (xii) Humidity |
| (xiii) Ventilation | (xiv) Constant noise | (xv) Morale | (xvi) Intermittent noise |

2.5 Questions for Exercise

(a) Objective Questions

- The physical environment consists of many factors among those one factor is :
 - Cloth
 - Water
 - Illumination
 - Person

Answer — (c)

- Which of the following is not associated with illumination :
 - Intensity
 - Distribution
 - Depth
 - Colour

Answer — (c)

(b) Short Answer Type Question

- Name the essential elements that comprise physical environment.
For Answer See the whole lesson
- Discuss the role of noise on morale of the subject.
For Answer See 2.2.4 (b)

(c) Long Answer Type Questions

- Discuss the role of illumination and noise on the output in a factory. Support your answer.
- How important is atmospheric condition in a factory? Discuss /
- Write short notes on the following :
 - Temperature
 - Humidity

(c) Noise

(d) Ventilation

2.6 Suggested Readings

1. Blum & Naylor — Industrial Psychology
2. Schultz — Industrial Psychology
3. Tiffin — Industrial Psychology



Group - A

INDUSTRIAL PSYCHOLOGY**Fatigue and Monotony****Lesson Structure**

- 3.0 Objective
- 3.1 Introduction
- 3.2 Main Theme
 - 3.2.1 Nature of Fatigue
 - (a) Decrement in Mental Power
 - (b) Decrement in Physical Power
 - (c) Decrease in Production
 - (d) Psychological Aspect of Fatigue.
 - 3.2.2 Difference Between Fatigue and Monotony
 - 3.2.3 Causes of Fatigue
 - 3.2.4 Measures to Reduce Fatigue
- 3.3 Nature of Monotony
 - 3.3.1 Causes of Monotony
 - 3.3.3 Conclusion
- 3.4 Summary
- 3.5 Key Words
- 3.6 Questions for Exercise
 - (a) Objective Questions
 - (b) Short Answer Type Questions
 - (c) Long Answer Type Questions
- 3.7 Suggested Readings

3.0 Objective

The objective of this lesson is to make the students understand fatigue and monotony in industrial context. For the complete understanding of the lesson we shall examine nature of fatigue and factors associated with fatigue, we will differentiate between fatigue and monotony, causes of fa-

tigue and monotony.

At the end the whole discussion will be assimilated, a summary and key words used in this lesson will be given. Lastly to check the understanding of the whole lesson the students shall be tested through different types of questions (objective, short and long) and to make the lesson more understandable some books have been quoted in suggested readings.

3.1 Introduction

In this unit we shall examine the effect of fatigue and monotony in industrial context. Fatigue is very important aspect in industrial psychology. It is concerned with line and staff managers. Psychologists are employed as staff members. Fatigue is a very popular word that we often use but in psychology it has been conceived in a different way. Generally we can say that fatigue is a reduced capacity to work. It is something internal that cannot be seen but can be observed by the physiological condition and output. There are a number of factors influencing fatigue that we will see in detail.

In the same way monotony is a state which cannot be seen but can be observed by performing repetitive work. It is a state of mind which implies no emotional dislike. A job is monotonous because it is uninteresting. It is a type of characteristic not related to particular job. It has been defined by scientists in many ways that we will see in detail under different headings.

3.2 Main Theme

3.2.1 Nature of Fatigue

Fatigue, in a common sense view, is a reduced capacity to work. Fatigue causes decrement in activity for further work as a consequence of previous activity where a person was trying almost as hard as he could. It has been conceived as a type of "negative appetite for activity".

Someone has defined fatigue in the following words, "What is fatigue no one knows, The word is of the nature of such term as "intelligence used to cover a multitude of states for some of which there may be objective co-rotates, while for others there is no communicable relationship between subjective experience and objective expression."

In other words, it can be said that it is very difficult to identify the nature of fatigue. Some scientists says that the word fatigue is much allied to the word "intelligent" and "instinct". It is thought as subjective for some observers and objective for others. As such there is practical as well as real difficulty in defining "fatigue". The most acceptable definition of fatigue is that which explains the physical aspect, decrement of mental capacity which results in decreased output. If we combine all the important aspects of fatigue it can lead to the following :

1. Physiological
2. Work decrement
3. Feeling of fatigue,

But to understand the nature of fatigue completely, we shall classify fatigue under following categories or conditions :

(a) Decrement in Mental Power : There is a decrement in the mental power with continuous mental work. It impairs mental capacity of the workers and there is a clear decrement in production. After using excessive mental energy the individual fails to do any further mental work. This type of condition has been called mental fatigue.

Many psychologists have attempted to study the existence of fatigue. It was found that when a man develops mental fatigue, he can not think clearly. He cannot turn his mind from imaginary wrongs done to him to focus it upon the wrong what he is doing. Mental fatigue also influences the feelings, emotions and way of thinking of the workers. As Vitels explains, "A tired man is as quick to anger as he is slow and shiped in his thought," An angry man does things without hesitation which he would normally never do, "When he is in right mind,

(b) Decrement in Physical Power : The fatigue may be described as a decreased capacity to work as a result of hard work. It is a diminished capacity of doing further work, indicative of reduced output. It is thought to be a physiological state of a person involving changes in organic functions and the production of chemical products. It has been illustrated through the use of finger engrograph in which fatigue resulting in reduced productivity. In fatigue there are some psychological changes occurring on account of chemical changes :

The reduction in energy due to hard work glycogen produced by muscles changes into a poisonous substance i.e. lactic acid. That can be reduced only by using extra Oxygen.

However, some psychologists believe that fatigue is due to changes in the chemical composition of blood. This has been supported by some studies on animal . Such changes can be produced sometimes even without fatigue.

It has also been observed that muscular fatigue also influences nervous system.

(c) Decrease in production : According to this view fatigue can be defined in terms of decrement in production. It is loss of energy due to work which has been defined as fatigue. Different kinds of experiments have been done to measure extent and degree of fatigue. There is first of all individual difference in fatigue. (Studied by Mosso and Loteyko). They found different resistance to do different physical work. Lehman reached to a conclusion that there were three types of constitution according to energy :

(i) Energetic type : While plotting a curve the strokes maintains a high level, then decreases finally drops to a lower level and is maintained. Sometime it is before the point of exhaustion is reached.

(ii) Unenergetic type : Producing a curve that drops steeply and maintains a low level before exhaustion.

(iii) Normally energetic or fatigued type : Producing a curve shows a rapid or more or less regular drop associated with a gradual accumulation of fatigue.