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Study on Office Workstation with Respect to Physical Environmental Parameters

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ABSTRACT The physical environment in office is a combination of door, window, area of workstation, placement of light fixtures etc. When physical environmental parameters are provided to office workers with respect to their needs, they are satisfied about it. When office workers get comfortable physical environment, it enhances their productivity and efficiency. Present investigation is undertaken with an objective to study the physical environmental parameters at office workstations. Present investigation is undertaken in Parbhani city of Maharashtra state during the year 2008-2009. Looking into the advantages of questionnaire and interview schedule, both methods were implemented for the collection of data. It can be concluded that in case of windows 50.4 per cent rooms had two windows of 3.5'x4', 40 per cent rooms had three windows of 3'x3.5' while 9.6 per cent rooms were having four windows of 3'x4'. Concerning orientation of the openings, it is observed that 37.6 per cent rooms were having opening on the east side, 2.4 per cent, rooms were having opening on the west side, 24.8 per cent, rooms were having opening on the north side and 35.2 per cent were having opening on the south side. It was noted that bigger room sizes were shared by two (15'x10'), four (18'x20') and 6 to 7 (20'x22') members respectively, while the room of 8'x12' were occupied by single persons.

INTRODUCTION

The physical environment of office is a combination of door, window, area of workstation, placement of light fixtures etc. When physical environmental parameters are provided to office workers with respect to their needs, they are satisfied about it. When office workers get comfortable physical environment, it enhances their productivity and efficiency.

The psychological effect of physical environment on office personnel has been generally ignored in the planning of layout and furnishings. The environment can have either positive or negative effects on employee behavior, attitude and work. Some types of jobs require different physical structures than others for best performance. The effects of various kinds of stimuli are examined. Tabuchi et al. (1995) show that symbolic artifacts such as light and light fixtures create an atmosphere that will have a desirable or undesirable effect. Physical environment will be considered an aspect of the work environment which directly affects the human senses. Something as simple as the seating arrangement around a table or the amount of ambient light and sound can completely change the way each individual relates to their partners. These material factors are the most obvious ones; they include light and sound intensity, interaction distance, time of day, size and shape of room, table, or work area, and dozens of other conditions. Each of these change the interpersonal interaction and productivity in office (Toftum 2002). Considering these aspects, this study was carried out with the objective to study the physical environmental parameters at office workstation.

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METHODOLOGY

The present study was conducted in order to evaluate physical environmental parameters in office workstation. To meet the objectives of the present study the procedure followed was as below.

Locale of Study: The present study was conducted in Parbhani city of Marathwada region in Maharashtra state during the year 2008-2009.

Selection of Samples: For the study, a sample of twenty- five subjects, each from the administrative office of Marathwada Agricultural University, Collectors office, Zilla Parishad Office, District Welfare office and Municipal Council office were randomly selected. Thus, the total number of subjects were one hundred and twenty-five.

Development of Questionnaire cum Interview Schedule: In general, the word questionnaire refers to a device for procuring answers to questions by using a form which the respondent fills in himself. A schedule is the form containing some questions or blank tables which are to be filled by the respondent.

Rating schedules are used for sociological or psychological research. They are used in cases where attitude or opinion is to be measured (Bajpai 1960). Looking into the advantages of questionnaire and interview schedule, both methods were implemented for the collection of data. The questionnaire cum interview schedule was prepared to elicit the general information and specific information. General information included independent variables, such as: Age, Education, Sex, Income and Type of work etc.

The aspects covered under specific information were schedule of openings, number of light fixtures, fans and coolers which were known by application of developed scale. Questionnaire was pretested for its clarity, ambiguity, additions and deletions of question and the finalized questionnaire cum interview schedule was used for recording the data.

RESULTS AND DISCUSSION

A study on office workstation with respect to physical environmental parameters was carried out, and the collected data and statistical analysis have yielded the following results.

Table 1 shows information regarding openings of workstation. Schedule of openings play an important role in office workstation. Openings in office include doors and windows. Windows and door provide natural light and natural air flow. That's why requirement of doors and windows in office workstation is an important aspect. It is cognizant from the Table that maximum number of the rooms (113) had one door of 7'x4' whereas only 12 rooms had two doors of 6'x3'. In case of windows, 50.4 per cent rooms had two windows of 3.5'x4', 40 per cent rooms had three windows of 3'x3.5' while 9.6 per cent rooms were having four windows of 3'x4'.

Table 1: Openings of workstation

S. No.	*Particulars*	*Frequency and percentage (N=125)*	*Size*
1.	Door-1	113(90.4%)	7' x4'
	Door-2	12 (9.6%)	6' x3'
2.	Window-2	63(50.4%)	3.5'x4'
	Window-3	50 (40%)	3' x3.5'
	Window-4	12 (9.6%)	3' x4'

Note: Figures in parenthesis indicate percentages

Area of workstation and orientation of openings affect productivity and efficiency of office workers. Size of workstation and size of room is concern with the workers satisfaction. For enhancing the work output all the physical environmental parameters play an important role. Table 2 shows that 14.4 per cent office workers were having work stations on the side of the room, followed by 38.4 per cent office workers having work stations in the center of the room, 27.2 per cent office workers were having work stations near the door and 20 per cent office workers were having workstation near the windows. A general observation and discussion with the office workers revealed that they preferred workstation near the window. These findings are almost similar to Eicker et al. (2006) who mentioned that occupants tend to prefer horizontal windows and that they would accept a minimum window area of 20-30% as satisfying, satisfaction is increasing with window area ranging to 100% depending on the situation.

Concerning orientation of the openings, it is observed that 37.6 per cent rooms were opening on the east side, 2.4 per cent, rooms were opening on the west side, 24.8 per cent rooms were opening on the north side and 35.2 per cent had an opening on the south side. It is cognizant from size of workstation that 54.4 per cent respondents were having 4'x3' workstation size, while 45.6 per cent respondents were having 5'x4' workstation size.

It is seen from the Table that 59.2 per cent respondents were having the workstation in the room size 15'x10 followed by 5.6 per cent with a room size of 18'x20 and 4 per cent respondents

Table 2: Details of work station

S.No.	*Particulars*	*Frequency and percentage (N=125)*
Area of Workstation		
	Side of the room	18 (14.4%)
	Centre of the room	48 (38.4%)
	Near the door	34 (27.2%)
	Near the windows	25 (20.0%)
Orientation of the Openings		
	East	47 (37.6%)
	West	3 (2.4%)
	North	31 (24.8%)
	South	44 (35.2%)
Size of Workstation		
	4'x3'	68 (54.4%)
	5'x4'	57 (45.6%)
Size of Room		
	15' x 10'	74 (59.2%)
	18' x 20'	7 (5.6%)
	20' x 22'	5 (4%)
	8' x 12'	39 (31.2%)

Note: Figures in parenthesis indicate percentages

were sitting in a room size 20'x22', whereas 31.2 per cent respondents were having the workstation in the room size 8'x12'. It was noted that bigger room sizes were shared by two (15'x10'), four (18'x20') and 6 to 7 (20'x22') members respectively, while the room of 8'x12' were occupied by single persons.

Therefore, it can be summed that 38.4 per cent respondent had workstation in the center of the room, 37.6 per cent rooms had an opening towards the east, 54.4 per cent respondents had workstation size of 4'x3' and 59.2 per cent respondents were having their workplace in a room size of 15'x10'.

Light fixtures in an office workstation are an important aspect of physical environment. In the office, light in proper proportion helps office workers do better work. In most offices, natural light is not sufficient, that's why artificial light is used. Table 3 shows the information regarding light fixtures in the workplace. It is evident from the table that artificial light is required by 48 per cent respondents for five hours during the day followed by 36.8 per cent requiring artificial light for six hours while 15.2 per cent respondents used artificial light for about four hours a day.

Concerning placement of light fixture, it is observed that 50.4 per cent felt them inconvenient while the remaining opined that the placement of light fixtures is convenient. The light

Table 3: Information regarding light fixtures at office workstation

S. No.	*Particulars*	*Frequency and percentage (N=125)*
1.	*Frequency of Use of Artificial Light (hr)*	
	4 hr	19 (15.2%)
	5 hr	60 (48%)
	6 hr	46 (36.8%)
2.	*Placement of Light*	
	Convenient	62 (49.6%)
	Inconvenient	63 (50.4%)
3.	*Placement of Light Fixture*	
	Wall	48 (38.4%)
	Ceiling	77 (61.6%)
4.	*Wattage at Light Fixture*	
	40 watt	57 (45.6%)
	60 watt	68 (54.4%)
5.	*No. of Light Fixture*	
	1	55 (44%)
	2	60 (48%)
	3	6 (4.8%)
	4	4 (3.2%)

Note: Figures in parenthesis indicate percentages

fixtures were placed on the ceilings at work places for seventy- seven respondents while the fixtures were placed on walls for 38.4 per cent respondent work places. With regards to the wattage of the light fixtures, the work places had 40 watt (45.6 %) and 60 watt (54.4 %) fluorescent tubes. The results for number of light fixtures at workplace show that most of the rooms (48 %) had two tubes followed by rooms with one tube (44 %) while the work places with three (4.8 %) and four (3.2 %) tubes were very few.

CONCLUSION

It can be concluded that in case of windows 50.4 per cent rooms had two windows of 3.5'x4', 40 per cent rooms had three windows of 3'x3.5' while 9.6 per cent rooms were having four windows of 3'x4'. Concerning orientation of the openings, it is observed that 37.6 per cent rooms were having opening on the east side, 2.4 per cent, rooms were having an opening on the west side, 24.8 per cent, rooms were having an opening on the north side and 35.2 per cent were having an opening on the south side. It was noted that bigger room sizes were shared by two (15'x10'), four (18'x20') and 6 to 7 (20'x22') members respectively, while the room of 8'x12' were occupied by single persons.

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